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THE "COMBINED OPERATION" IN LOW BACK AND SCIATIC PAIN

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We have reviewed records of a series of patients treated by what we at the Mayo Clinic call a "combined operation for low back and sciatic pain." This group of cases includes those in which one member of the neurosurgical staff has explored the spinal canal for evidence of an intraspinal lesion (and has removed it if it was found) and in which one member of the orthopedic surgical staff has carried out bone grafting to bridge the affected parts. The study includes the patients so treated in the years 1936 to 1940 inclusive. The procedure has gone through a period of evolutionary development from the time when operations for protruded intervertebral disk began to be performed in any number.

NUMBER

The number of combined operations performed has increased somewhat during the years of this study. In the year 1936 no combined operations were performed in cases of suspected protrusion of an intervertebral disk. In 1937 1 per cent of the patients for whom laminectomy was performed also underwent a bone graft operation. In 1938 6.5 per cent, in 1939 14.8 per cent and in 1940 14 per cent of the cases in which laminectomy was performed for suspected protrusion of an intervertebral disk bone grafting was done. The increase in this percentage is due not only to the fact that both neurosurgeon and orthopedic surgeon felt that some patients with protruded disk should undergo bone grafting, but also to the fact that in many cases in which the orthopedic surgeon had planned a bone grafting operation he asked that the neurosurgeon perform laminectomy so that it could be determined whether or not a protruded disk might be present. In the latter group we particularly refer to cases of spondylolisthesis, spondylolysis and the like.

STATUS OF THE COMBINED OPERATION

It is safe to say that considerable difference of opinion may still exist as to the importance of a bone graft or fusion operation in connection with removal of a protruded intervertebral disk. Many orthopedic surgeons, we are sure, believe that in most, if not all, cases such a combined procedure should be carried out. On the other hand it is probably true that many neurosurgeons feel that such combined procedures are not necessary.

It is our opinion that the surgeon can promise the majority of patients with protruded intervertebral disks relief by removal of the protrusion alone. However, it is also our opinion that there is a group of cases in which a bone graft or fusion operation should be done to relieve most of the symptoms and to give the best result.

REASONS FOR PERFORMANCE

Walsh and Love[1] in 1940 stated that "the patient who has a protruded disk and well developed spondylolisthesis should have fusion performed at the time of removal of the protruded disk. The patient who has associated spondylolysis probably should have fusion done at the time of surgical removal of the protruded disk. The patient who has extensive lumbosacral arthritis and a static type of backache in addition to a protruded disk and its resultant symptoms probably should have fusion done at the time when the protruded disk is removed."

It is the custom at the Mayo Clinic to have an orthopedic consultant see all patients suspected of having protrusion of an intervertebral disk before decision as to operation is made. In fact, in many cases two or more such consultations are held. The orthopedic surgeon, consulting the neurosurgeon, decides whether or not a fusion or bone grafting operation should be done. In general, the indications as outlined by Walsh and Love are followed. In many cases of congenital anomaly, such as sacralization, an anomalous neural arch or anomalous conformation of the body of the vertebra, in which there is an apparent instability of the vertebra in question, bone grafting will be done. In some cases judgment as to the instability and its importance is left until the time of the operation, at which, with the vertebral arches exposed, their stability is tested and the decision is made. If such instability is not found, the operation of bone grafting may be omitted.

It must be borne in mind that the roentgenographic appearance alone is not the determining factor in cases in which combined operations are chosen. A careful review of the patient's history must be carried out and the symptoms must be analyzed. It has seemed to us that in general only patients relieved by rest who have had recurrence of pain on resumption of activity will be suitable candidates for combined operation, provided, as noted previously, some evidence of instability

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1. Love, J. G., and Walsh, M. N.: Intraspinal Protrusion of Intervertebral Disks, Arch. Surg. 40:454-484 (March) 1940.

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of the lumbosacral portion is found. This may be modified to such extent that patients who have a long-standing static type of backache and who have superimposed evidence of a protruded disk, the pain of which is not relieved by rest, may be advised to undergo the combined operation.

A review of the records in the series from this particular point of view reveals that approximately two thirds of the patients complained of backache of the static type. About a third of the patients had backache of a less well defined type. In 8 cases there was no definite history of backache.

From the neurologic point of view it might be noted that among the 77 patients who had a protruded intervertebral disk 33 had decreased achilles tendon reflexes, whereas 24 of the 62 patients who underwent exploration with negative results had a decreased achilles tendon reflex. In the group of 77 patients who had protruded intervertebral disks, results of spinograms were positive in 49 cases and results of examination

TABLE 1.—*End Results: Combined Operation for 77 Patients Found at Exploratory Operation to Have Protruded Intervertebral Disks, 1936-1940 Inclusive*

Diagnosis	Results, Patients *				
	Good	Fair	Poor	Not Traced	Total
Thin disks	36	9	1	2	38
Spondylolisthesis	4	1	0	0	5
Spondylolysis	1	2	0	0	3
Sacralization	8	0	3	1	12
Hypertrophic changes	3	2	0	1	6
Recurrent protruded disks	2	2	1	1	6
Recurrent symptoms after operation for protruded disk	0	1	1	0	2
Anomalous arch	1	0	1	0	2
Bilateral sacroiliac arthritis	0	1	0	0	1
Multiple disks not removed	0	0	1	0	1
No skeletal change	1	0	0	0	1
Total patients	46	18	8	5	77
Percentage of traced patients	64	25	11		
Analysis of some of the fair and poor results					
Graft not satisfactory		3	4		
Infected graft sequestrated and operation able fusion		1			
Psychoneurosis		1	2		
Compensation not settled		1			

* See text for explanation of grading of results.

with radiopaque oil were positive in 5 additional cases. Hence, for 54 of 77 patients with protruded disks results of myelographic examination were positive.

In the group of 62 patients for whom results of exploration were negative, results of spinograms were positive in 20 cases and in 1 case results of examination with radiopaque oil were positive. This apparent discrepancy between the results of the spinogram and results of surgical exploration is explained by the fact that, in this series, cases of thickened fibrotic ligamentum flavum in which results of spinograms may be positive have been grouped with cases in which results of exploration were negative.

There is also a group of patients who obviously have been seriously handicapped and have not responded to various types of conservative measures for whom exploration by the neurosurgeon has been carried out and for whom bone grafting has been performed. Another group of not too happy results is represented by those patients who have undergone previous operations of one type or another which have failed and for whom we have undertaken another operation. Decision to operate in these cases must be made only after the most careful analysis of all factors. Results of many of our examinations, such as roentgenograms and spinograms, may be unreliable because of previously performed operations; the decision to operate rests on the surgeons and their ability to distinguish a condition based on true organic lesions from a condition arising from a neurosis.

RESULTS

No attempt will be made herein to incorporate the many studies of end results which have been published in years past on the question of fusion operations alone. Ghormley and Wesson [2] in 1936 reviewed results of all fusion operations done at the Mayo Clinic up to that year for low back and sciatic pain, not including spondylolisthesis. In this review of the patients for whom lumbosacral grafting (from the iliac crest) was combined with sacroiliac fusion on the affected side, 72 per cent obtained good results. On the other hand, on those patients who underwent lumbosacral grafting alone only 56.5 per cent obtained good results when bone from the iliac crest was used, and only 66 per cent of those treated with bone from the tibia obtained good results.

Studies of the end results of operations of the combined type are few. Barr and Mixter [3] reported that complete relief was secured for 77 per cent of all patients who underwent operation for protruded disk, with or without the fusion procedure. Ninety-one per cent of the patients on whom the fusion operation was performed in addition to removal of the protruded disk obtained complete relief, whereas in the group (from the same series) in which the protruded disk was removed without the fusion operations 69 per cent of the patients were completely relieved. The authors stated that "spine fusion at the time of laminectomy seems to give definitely better results than laminectomy alone." Bradford and Spurling [4] said that "the use of spinal fusion in selected cases may well increase the number of satisfactory results" but gave no statistics with which to substantiate their statement.

Studies of the end results of removal of protruded disks alone are not very numerous. Love and Camp [5] in 1937 reported the results obtained in 50 cases in which removal of protruded disks had been done. Thirty-three patients were completely relieved of the symptoms for which the operation had been performed. Fifteen were benefited by the operation but not completely relieved, and 2 patients secured no benefit from the operation. Craig and Walsh [6] reported an additional group of 89 cases in which protruded intervertebral disks had been removed and wrote that good results had been obtained in 83.3 per cent of cases in which compensation was not involved and that unsatisfactory results had been achieved in 16.7 per cent of the same total group. In this group (in which compensation was involved) the percentage of good results was 59.1 and the percentage of unsatisfactory results was 40.9.

2. Ghormley, R. K., and Wesson, H. R.: The Surgical Treatment of Low Back Pain and Sciatica, South. M. J. **29**: 806-811 (Aug.) 1937.

3. Barr, J. S., and Mixter, W. J.: Sciatic Pain in Low Back Derangements: Its Incidence, Significance and Treatment; Symposium; Posterior Protrusion of the Lumbar Intervertebral Disks, J. Bone & Joint Surg. **23**: 444-446 (April) 1941.

4. Bradford, F. K., and Spurling, R. G.: The Intervertebral Disk, with Special Reference to Rupture of the Annulus Fibrosus with Herniation of the Nucleus Pulposus, Springfield, Ill., Charles C Thomas, 1941, p. 83.

5. Love, J. G., and Camp, J. D.: Root Pain Resulting from Intraspinal Protrusion of Intervertebral Disks: Diagnosis and Surgical Treatment, J. Bone & Joint Surg. **19**: 776-804 (July) 1937.

6. Craig, W. McK., and Walsh, M. N.: The Present Status of the Protruded Disk Syndrome, read before the International Congress of Neurological Surgeons, Copenhagen, Denmark, Aug. 21, 1939.

Keegan and Finlayson[7] reported that in 57.5 per cent of their cases there was from 90 to 100 per cent recovery, that in 17.5 per cent there was from 80 to 90 per cent recovery, that in 10 per cent there was 50 per cent recovery and that in 15 per cent there was no recovery. Other similar groups of cases have been reported, but as yet no reports are available concerning any large group of patients followed for several years.

The group of patients whose records we have reviewed have been followed for at least a year, and in some cases for three and four years. Many of the patients have been seen by one of us at least a year or more after the operative procedure was carried out. Those not seen at least a year later have been followed by letter. We have classified as "good" the condition of all patients who have reported that the pain for which operation was done is completely relieved and that they have returned or could return to their former work. Patients whose condition is classified as "fair" have reported improvement or that their pain is partially relieved. Patients whose condition is listed as "poor" are those for whom no improvement was secured. Results appear in tables 1 and 2. This separation into the two tables is self explanatory: in table 1 are shown the end results secured in cases in which protruded intervertebral disks were found at operation by the neurosurgeon; in table 2 are shown the results obtained in cases in which such disks were not found at exploratory operation.

We have reviewed the results of roentgenograms in all cases before operation and in most cases after operation, although in some cases late postoperative roentgenograms were not available. The various diagnoses seen in tables 1 and 2 represent condensation of a larger group of diagnoses; condensation was carried out to simplify and clarify the subject. We believe that for the purposes of this paper such condensation has not detracted from the factual data of the study. For instance, the exact situation of thinned disks is not given. In some cases the fourth lumbar disk was found to be thinned, in others the fifth lumbar disk was thinned and in still others both were thinned. The great majority of these were, in our opinion, instances of pathologic thinning rather than of anatomic thinning. We recognize the anomalous type of thin disk and also the type in which sacralization has produced a thin disk; these have not been counted as such. In the group of cases listed as "sacralization" we actually found only instances of partial sacralization. In these, union between the transverse processes and the sacrum was not solid and in most of these both a rudimentary type of disk and rudimentary facets were present, producing in many cases an unstable type of lumbosacral joint. In table 2 the list of "anomalies" includes both anomalous facets and anomalies of the bony arch, such as spina bifida and other conditions.

Recurrence of protruded intervertebral disks and recurrent symptoms arising after operation for protruded disks are listed separately (table 1); they need no explanatory comment.

OPERATION

We have used the tibial graft as a rule in these cases. In a small number of cases bone from the iliac crest was used for grafting in this series, but for the most part bone from the tibia was used. We feel that the operating time saved by the tibial graft is important. While the neurosurgical team proceeds with laminectomy, the orthopedic team removes the required bone from the tibia. By the time the bone from the tibia has been removed and the wound closed, laminectomy usually is completed and the bed for the graft largely prepared by the neurosurgeon. The orthopedic surgeon generally finishes the preparation of the bed and places the graft. As a rule, bilateral grafts are placed across the unstable region, which usually consists of the area from the fourth lumbar arch to the second sacral arch.

Preparation of the bed is most important. The laminas and spinous processes of the area are entirely denuded of muscular and ligamentous attachment, and chips of bone are elevated from both the laminas and the spinous processes. The graft is divided into two pieces, and one is placed on each side. Cancellous bone is packed about the graft to insure its union to the host area. When a defect produced by laminectomy has been so extensive as to make it difficult to bridge the defect, a unilateral graft can be used or a double graft can be placed on the side opposite that of the laminectomy defect. Too much care cannot be exerted in the placing of these grafts.

In these cases a minimal amount of bleeding should occur, so that postoperative hemorrhage with resultant pressure on the spinal cord will be avoided, yet it is important to scarify the lamina and spinous process of each vertebra to be sure of producing a bed to which the graft will unite. The graft must not be placed so that it can slip and cause pressure on the dura. Firm closure of the wound without drainage is important. In a very few cases, to protect the neurosurgeon's field, a drain has been used postoperatively for from twenty-four to forty-eight hours. If it is watched carefully and then removed it may do no harm, but the use of drains after bone grafting has been done usually is not desirable.

TABLE 2.—*End Results: Combined Operation for 62 Patients Found at Exploratory Operation Not to Have Protruded Disks (Some Had Thickened, Fibrotic Ligamentum Flavum), 1936-1940 Inclusive*

Diagnosis	Results, Patients *				
	Good	Fair	Poor	Not Traced	Total
Thin disk	14	3	1	1	19
Spondylolisthesis	6	2	0	1	9
Spondylolysis	5	0	0	0	5
Sacralization	5	2	0	0	7
Anomalies: Anomalous facets, spina bifida and so on	6	0	1	1	8
Fractured facet	0	2	1	0	3
Spondylolisthesis plus fracture of body at first and third lumbar vertebrae	0	1	0	0	1
Angulated sacrum	1	0	0	0	1
Sixth lumbar vertebra	0	4	0	0	4
Infectious lesion of disk	1	0	0	0	1
No skeletal change	3	1	0	0	4
Total patients	41	15	3	3	62
Percentage of traced patients	70	25	5		
Analysis of some of the fair and poor results					
Grafts not satisfactory		2			
Compensation not settled		1	1		

* See text for explanation of grading of results.

POSTOPERATIVE CARE

After the operation only a firmly applied dressing is used. Sometimes it is held in place by means of a scultetus binder. The patient is placed on a Bradford frame and turned every six hours for the first few days postoperatively. At the clinic we usually allow the patients to turn themselves by the end of a week, and the hospital period for most patients has been shortened to between three and four weeks.

7. Keegan, J. J., and Finlayson, A. I.: Low Back and Sciatic Pain Caused by Intervertebral Disk Herniation, Nebraska M. J. 25:179-184 (May) 1940.

The patient is sent home with a cloth corset at the end of that time and is instructed to restrict activity. The patient may be out of bed for three hours a day for six weeks; then this time may be increased until a normal schedule has been reached. A normal schedule generally is reached by the end of three or four months after operation. At that time the patient either returns for examination or roentgenograms are sent in for inspection. If the grafts seem solidly united and strong, the patient may be permitted to return to full work. If there seems to be delay in union of the graft, the patient may be allowed a limited amount of work. It is important to be able to judge the state of the graft before decision as to the patient's return to work is reached. In the majority of cases, healing will be sufficiently advanced at four months postoperatively to permit the patient's return to work as noted previously herein, but when delay in union of the graft has occurred resumption of full activity must not be permitted. In a few cases it may be a year before the grafts are fully united and strong enough to permit the patient's resumption of full activity.

TABLE 3.—*End Results: Type of Work to Which 139 Patients Were Able to Return After a Combined Operation; 1936-1940 Inclusive*

Work	Result *				
	Good	Fair	Poor	Not Traced	Total
Protruded disk found at surgical exploration					
Heavy	15	3	4	1	23
Light	10	9	1	2	22
Housewives	10	4	3	1	18
Work status unknown	11	2	0	1	14
Total	46	18	8	5	77
Protruded disk not found at surgical exploration					
Heavy	7	3	0	1	11
Light	9	7	1	1	18
Housewives	13	3	1	0	17
Work status unknown	12	2	1	1	16
Total	41	15	3	3	62

* See text for explanation of grading of results.

It is important to allow some degree of muscular activity as soon as the grafts are united, because this will stimulate union and ossification of the graft, and if the activity is not too violent it will do no harm. As soon as union has become strong enough, exercises designed to reestablish muscular tone and strength should be prescribed and carried out. Pain of some degree may accompany such exercises, and the patient should be warned of the possibility of it; otherwise, fear may prevent the patient's carrying out his exercises and thereby delay his return to normal activity. The belt should be discarded as soon as muscular strength has been fairly well reestablished.

COMMENT

In the tabulated material we have noted some of the contributing factors which may have played parts in our "poor" and "fair" results. It should be noted that there were no operative deaths in the series. Only 1 of the patients now is dead, and he was killed in an automobile accident months after the operation. In only 1 case did the graft become infected to such an extent that it had to be removed. In this case the achievement of fusion was questionable, and the result is only "fair." Definite psychoneurosis seemed to be an important factor influencing the "poor" results secured in 2 cases and the "fair" result obtained in 1 case. In only 3 cases did it seem to us that failure to settle satisfactorily difficulties concerned with compensation had played a part in estimation of the result. This statement can be made in spite of the fact that 29 patients of the entire group definitely were involved in compensation litigation.

In 11 cases it seemed to us that inadequate or unsatisfactory grafts played parts in the results obtained. In some the graft did not extend far enough, as in 1 case in which it was so placed as to cover an old fractured vertebra but did not reach the sacrum and bridge definite spondylolisthesis. In another case the graft bridged over the fifth lumbar and first sacral segments and failed to cover a large laminectomy defect above. In 1 or 2 cases the graft fractured. In others the grafts atrophied and partly absorbed, leaving very questionable fusion. Most of these conditions can be improved by more careful technic, and it is hoped that as experience in the combined operation is gained less difficulties from the aforementioned sources will be encountered.

Finally, it should be pointed out that many of our patients have returned not only to their former occupations but to heavy work. A summary of this is noted in table 3.

Thus it is seen that laminectomy plus fusion need not limit a patient's career as far as his work is concerned. As improvement in technic and more nearly accurate diagnosis are achieved, it is to be hoped that these figures will be further improved.

As far as we know, protruded intervertebral disks have not recurred after fusion, although this statement cannot be fully substantiated because it is possible that with more thorough study it would be found that some of our patients who obtained "poor" results might now have recurrent protruded disks. It is to be hoped, however, that by means of the combined operation the incidence of recurrence of protruded disks may be diminished.

As to this study providing any light on the question of the late changes which might arise from removal of protruded disks when fusion is not carried out, we cannot say that anything in the review of this series would lead us to advocate fusion in all cases in which protruded intervertebral disks are removed. Such an action seems unnecessary to us now.

ABSTRACT OF DISCUSSION

DR. HENRY BRIGGS, East Orange, N. J.: Orthopedic surgeons owe a debt to Mixter and Barr, the Mayo Clinic, Spurling and others for pioneer work in this field. Dr. Ghormley has not mentioned today his own facetectomy. This was an earlier approach to the same problem and is a procedure that I predict will play an ever increasing role in the solution of backache and radiating pain as orthopedic surgeons begin to explore the pathologic conditions of the intervertebral foramen. It was pleasing to hear Dr. Ghormley say that he is fusing more and more backs following laminectomy. He is conservative in his selection of cases. I wish Dr. Ghormley would clarify his indications for the "combined operation." He tells us that 66⅔ per cent of the cases were fused because of an associated static type of backache. It is difficult to see, for example, how one can discern by either the history or the physical examination a static type of backache in a person from whom one later removes a herniated nucleus pulposus. Orthopedic surgeons recognize as a symptom complex the so-called unstable fifth lumbar vertebra. Into this classification goes that large, mysterious group of cases in which there are painful low backs and often radiating pain but not the classic neurologic findings of the herniated nucleus pulposus.

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Our great interest now lies in these cases. I am beginning to feel that the pain and chronic muscle spasm of a large number of them can best be explained on the basis of an impending impingement of a lumbar nerve root. I would like to ask Dr. Ghormley how he recognizes an unstable fifth lumbar vertebra at operation. I was not surprised to hear that no disk was found by the neurosurgeons in 24 cases with decreased ankle jerks. Neurosurgeons do not know how to look for them. The entire operative procedure for the treatment of a ruptured nucleus pulposus is primarily orthopedic surgery, not neurosurgery. I am amazed that the Mayo Clinic still seems to inject air or radiopaque oil in the typical case of herniated nucleus pulposus. A positive film aids little in localization and a negative plate means nothing. I agree with Dandy as to the uselessness of the procedure. I decry the use of the long tibial or iliac graft used as a strut. That type of fusion is mechanically unsound, physiologically ill conceived and technically unnecessary. The followers of Hibbs will bear me out in this statement. A chip fusion is the method of election. The latter, if desired, can be supplemented by a laterally placed spinous process plug.

DR. A. W. ADSON, Rochester, Minn.: The combined operation, as described by the authors, has a useful place in the treatment of low back and sciatic pain. The removal of a protruded disk affords relief to patients whose symptoms arise from irritation of a nerve produced by a bulging, cartilaginous mass. However, not all the symptoms may be due to the protrusion or a prolapse of the nucleus pulposus, since there may be accompanying arthritis, beginning spondylolisthesis, sacralization of the last lumbar vertebra or the existence of a long and excessively movable lumbar segment of the spinal column. When such a situation exists, neither the removal of the protruded portion of the disk nor the insertion of a bone graft in the sacrolumbar region will suffice as a single operation. It is in this particular group that the combined operation is indicated, since the patient needs the stabilization afforded by the fusion procedures in addition to the removal of the bulging cartilaginous mass, protruded disk, responsible for the radiculitis. The question concerning the value of myelographic studies in the differential diagnosis of protruded disks has frequently been raised. In many instances the neurologic findings are sufficient to justify a diagnosis and the localization of the lesion, but more often than not the confirmatory evidence of a myelographic film is needed to support the tentative diagnosis and localization. Radiopaque oil serves as a more accurate contrasting medium than thorium dioxide sol, air or oxygen. Should it or thorium dioxide sol be used, it is well to remove it after the study or at the time of the operation. Air or oxygen as a contrasting medium has the advantage of being absorbed and not being responsible for the development of radiculitis or meningitis. To whom should the patient with low back and sciatic pain be referred? My reply would be to the orthopedic surgeon. However, should the patient present neurologic findings unexplained by osseous changes, he is then entitled to a neurologic investigation. If the diagnosis is that of a protruded intervertebral disk which has given rise to recurrent episodes of pain, operation should be recommended and performed by the surgeon best qualified to carry out the procedure. In the event of indications requiring a combined operation, it has been our practice for both orthopedic and neurologic surgeons to perform their respective parts at the same operation.

DR. LEE A. HADLEY, Syracuse, N. Y.: As a radiologist I have for some time been interested in correlating the x-ray appearance of the spine with the anatomic and pathologic conditions found in the cadavers at the Medical College at Syracuse University. On dissecting a herniated nucleus, one exposes a linear fissure penetrating the posterior part of the annulus fibrosus. If, after complete removal of that hernia, dorsal extension is made on the spine, additional nuclear substance usually oozes out through the opening. I have wondered if that split should not be repaired. Patients with nerve root symptoms may have their nerve root pressure beyond the spinal canal. A spur projecting from the lateral margin of the fifth disk may encroach on the nerve to the extent of distorting its shape and displacing it from its normal position. In the lumbar region the lumen of the spinal canal is relatively large. When one compares it with the size of the cauda equina, there is plenty of room to spare. A rather large amount of disk substance or thickened ligamentum flavum must protrude into the canal before pressure against the nerve can result. It may deflect the nerve or raise it up, but the hernia must be pretty large to press the nerve into contact with some other point of counterpressure. Hernia into the intervertebral foramen is an entirely different matter. There one has a bony ring which cannot expand. In a stained section of the fourth and fifth intervertebral foramina, the fourth foramen shows the nerve root oval with plenty of room around it for blood vessels, areolar tissue, lymphatics and fibroid tissue. That is really an encroached foramen judged by the x-ray film, but the section shows plenty of room for the nerve and other structures. In the fifth foramen, on the other hand, the disk has extruded into the constricted foramen, compressing the nerve against the posterior wall and causing it to assume a triangular shape. This is definite microscopic evidence of nerve root encroachment by a herniated disk. It seems to me that this is a problem in which herniation of disk substance into the intervertebral foramen is more important than into the spinal canal, which is relatively much larger. The operator should explore these regions laterally well out between the pedicles.

DR. EDWIN W. RYERSON, Chicago: Many things have been said this morning with which I disagree. With most of what Dr. Ghormley and his co-authors said I do agree. If there was no movement in the fourth and fifth lumbar vertebrae there wouldn't be any extruded disks in the region of the fourth and fifth lumbar vertebrae. And if in the small children who yet have to make their way in life we performed an early fusion of the fourth and fifth lumbar vertebrae to the sacrum it would be simple to prevent all the woes they have at the Mayo Clinic, taking out so many disks. Remember that when you remove a portion of a disk it impairs the disk so much that eventually the space which was formerly occupied by the disk will be flattened down and the articular space will be diminished because of the descent of the fourth lumbar on the fifth or the fifth lumbar on the sacrum. Many of these patients, as the years go by, will begin to have recurrences of symptoms, not due to the protrusion of more intervertebral disks, but because the spaces for the nerve roots will be diminished so much that they will undergo arthritic changes and will produce painful pressure on these nerves. So, if we take out a disk we produce a potential future derangement which has not yet been proved in many cases. Only two weeks ago I heard a man in Chicago say that he had seen 3 cases in two weeks in which fifth lumbar disk extrusions had been removed by distinguished surgeons and in which after the lapse of a year the backs were so painful that an orthopedic surgeon had to be employed to perform a fusion operation. I think that fusion operations should be performed in all these cases of disk removal and not by the chip method, which is most unreliable, but by a combined operation with bone grafts from the tibia, and with chips from the tibia and from the laminas.

DR. RALPH K. GHORMLEY, Rochester, Minn.: I wish we could extend this session over the week end so that all of us might comment, because there is much to be said about the problem. I couldn't deal with all the points involved, by any means. I don't agree with Dr. Briggs; the neural surgeons are often our greatest friends, and there is nobody whose help I appreciate more when we are in trouble. They have helped us out of many a serious difficulty, and in any case in which we are contemplating lumbosacral bone graft or fusion we ask them to see the patient and request that they decide as to whether laminectomy shall be done at the time of operation. It is true that the results of exploration may be negative, but rather than risk the patient by proceeding with a combined operation of this sort the delay occasioned by such consultation is so slight that we feel it is justified. Moreover, the neurosurgeons have been very generous to us in allowing us to decide as to whether we wish to do a bone graft in their

cases. Hence, on the whole, I think the situation is a happy one, and one that has contributed much to our knowledge of low back and sciatic pain. It is difficult in many cases to determine whether or not a patient has true static backache, but if the relief achieved by rest is complete, we usually consider the condition not to have been truly static. Many cases are very hard to analyze and to place in one category. But if we feel that the patient is experiencing sufficient distress and is of the type who might be helped by operation, we will carry out the combined operation. Dr. Ryerson has more or less expressed my sentiments concerning solid grafts versus chip grafts, which is an old argument among orthopedic surgeons. As far as the question of exploration of the canal along the nerve root is concerned, I believe the operation should be done. It is being done, and the neural surgeon is doing a good job of it. For my part, I am glad to have the operation performed for me, so that I can see that the nerve is clear before grafting is carried out.

ACUTE PROTEIN DEFICIENCY (HYPOPROTEINEMIA) IN SURGICAL SHOCK

DUE TO SEVERE HEMORRHAGE AND IN BURNS, INTESTINAL OBSTRUCTION AND GENERAL PERITONITIS, WITH SPECIAL REFERENCE TO THE USE OF PLASMA AND HYDROLIZED PROTEIN

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The war has emphasized the importance of surgical shock in such injuries as severe hemorrhage and tissue trauma and has led to many advances in its treatment. Moreover, this increased interest has thrown much light on many other related clinical conditions in civil as well as military surgery, such as burns, intestinal obstruction, strangulation and general peritonitis. Because an acute protein deficiency is shared by these various conditions, I wish to approach their therapy biochemically rather than physiologically. Moreover, this point of view has been generally neglected and leads, I believe, to much of practical value.

Acute protein deficiency is shared by these conditions because they all suffer in common from an acute loss of plasma, which is essentially a protein-containing fluid. There are several reasons why this loss of plasma protein should be studied as an acute protein deficiency rather than simply as acute hypoproteinemia. In the first place the existence and clinical detection of the deficiency by measuring the serum protein is often masked by an associated dehydration (hemoconcentration) or hyperglobulinemia.[1] Second, the loss of plasma protein undoubtedly affects other protein tissues, certainly the liver and perhaps other sites. Third, the trauma in shock is often associated with protein losses from the body as a whole as well as from the blood, as shown by the metabolic observations of Cuthbertson,[2] who found excessive excretion of urinary nitrogen following experimental and clinical trauma of various types. Moreover, as a general rule pathologic processes are best viewed not from the most important tissue involved but as a phenomenon affecting the body as a whole. The concept of acute protein deficiency is justified, finally, by the additional circumstance that the body cannot correct the defect rapidly, thereby pointing to a direct and often life saving therapeutic

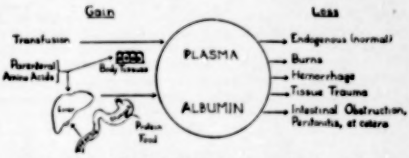

Fig. 1.—Plasma albumin is the most important fraction of the plasma proteins as far as maintaining the circulation and fluid balance is concerned, because it contributes 85 per cent of the colloidal osmotic pressure of the blood. The various factors which increase and decrease the plasma albumin are represented on the left and right respectively.

procedure, i. e. the prompt and adequate replacement of the protein loss, wherever it may be. Figure 1 is an attempt to represent graphically the relationship between plasma protein and the factors leading to its increase or decrease. It should be mentioned that the term surgical shock in this paper will be used to describe any acute circulatory impairment which follows a sudden fall in the blood volume and is not used to describe merely the more severe impairment which precedes death.

PREVIOUS WORK

The classic investigations of surgical shock which are being continued at the present time have clearly demonstrated the existence of diminished blood volume, decreased cardiac output and fall in blood flow, all of which are the physiologic changes responsible for the circulatory deficiency and for the profound clinical manifestations. Viewed thus, the therapeutic problem is one of restoring the circulation in order to maintain the vital processes, and especially that the metabolic changes induced by the deficient blood flow may be prevented from inducing irreversible tissue damage which is the inevitable prelude to death.[3]

Now it is quite easy to restore the circulation in most cases of shock; the injection into the blood stream

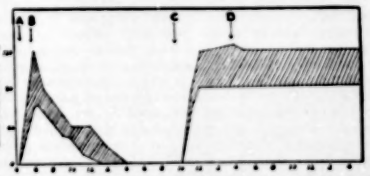

Fig. 2.—A woman aged 38, whose blood pressure curve is represented above, fell out of a second story window and was in shock on arrival at the Homer Phillips Hospital. Note the transient effect of saline solution and dextrose 5 per cent (*A*, 1,000 cc., *B*, 500 cc.) as compared with the sustained effect of the same volume of plasma (*C*, 1,000 cc., *D*, 500 cc.) in restoring blood pressure. The shaded area represents the pulse pressure. The numbers under the base line represent the time of day beginning at 4 p. m., when the patient was admitted.

early enough of an adequate volume of saline solution and dextrose will be followed by an increase in blood volume, pressure and blood flow. In mild cases this effect is sufficient and recovery eventually occurs.

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1. Peters, J. P.; Eisenman, A. J., and Bulger, H. A.: The Plasma Proteins in Relation to Blood Hydration in Normal Individuals and in Miscellaneous Conditions, J. Clin. Investigation **1**:435 (June) 1925. Elman.[10]

2. Cuthbertson, D. P.: Post Shock Metabolic Response, Lancet **1**:433 (April 11) 1942.

3. Wiggers, C. W.: The Present Status of the Shock Problem, Physiol. Rev. **22**:74 (Jan.) 1942. Cannon.[9] Harkins.[10]

Unfortunately, this simple means is insufficient in the severe cases because the beneficial effect is transient (fig. 2); indeed, the temporary improvement is soon followed by a further deterioration of the already impaired circulation. The most important reason for this deleterious effect of dextrose and saline solution is the fact that such solutions possess no colloidal osmotic pressure; in other words, their osmotic pressure is due to substances of small molecular size which pass readily through the wall of the capillaries (especially when permeability is increased) and leave the blood stream soon after they are injected, carrying along plasma, thus leaving the blood poorer in plasma protein than it was before.

The conception that it is really the loss of plasma which is important in severe hemorrhage was emphasized in two important but often forgotten contributions. In 1918 Rous and Wilson [4] showed that surgical shock following hemorrhage was not due to loss of the red cell component of the blood but to the plasma. About the same time Whipple and his co-workers [5] by plasmapheresis, a bleeding procedure which maintains the red cell volume at a normal level, showed that shock followed loss of plasma alone whenever the protein concentration was reduced sufficiently.

Fig. 3.—Severe hemorrhage from a peptic ulcer in a youth aged 17 years. Compare with figure 5. The data were supplied by Dr. J. L. Levy, Little Rock, Ark.

Toward the last of World War I, the futility and even danger of using saline solution and dextrose in severe shock was known,[6] although it was not generally realized for a decade or more after the war. For example, as late as 1936 large volumes of saline solution and dextrose were still being used in the treatment of severe burns, a lesion which shares with hemorrhage loss of plasma. On the basis of clinical studies [7] at the St. Louis City Hospital in 1935 I became interested in the biochemical rather than the physiologic changes in these patients because we demonstrated that hypoproteinemia was an important and persistent manifestation in severe burns and that the body had no rapid way of meeting this acute protein deficiency in the plasma. Applying the obvious principle of replacement therapy, we used plasma in burns for the first time, instead of dextrose and saline solution alone. The beneficial and even dramatic effects of this form of therapy are now generally realized. It is but a step from the use of plasma in burns to its use in other conditions associated with a loss of plasma protein, e. g. severe hemorrhage and tissue trauma, as well as intestinal obstruction and peritonitis. Indeed, one may say that the essential difference between plasma and simple solutions is the protein content of the former. And, since the therapeutic effectiveness of plasma is due to this difference, the fundamental concept of protein deficiency is obvious.

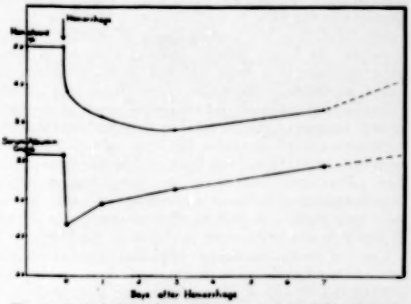

Fig. 4.—A single hemorrhage (3.5 per cent of the body weight of a 10 Kg. dog) was produced and the amount removed was immediately replaced with isotonic solution of three chlorides. Note the fall and slow return of the serum albumin concentration and even slower return of the red cells (hematocrit). The globulin fraction is not represented; it returns to normal much more rapidly (two to three days). (The hematocrit, which measures red cell volume, gives the same curve as the red cell count.)

PRESENT OBSERVATIONS AND COMMENT

In severe experimental hemorrhage, study of the plasma proteins revealed [8] that, although the acute hypoproteinemia which followed was spontaneously corrected, it required days rather than hours (fig. 4); obviously in severe cases hours are important, because

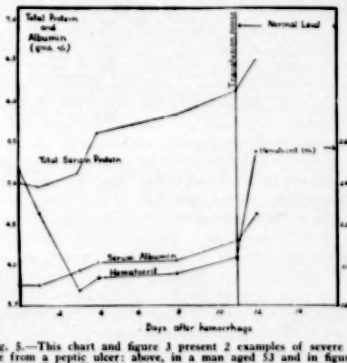

Fig. 5.—This chart and figure 3 present 2 examples of severe hemorrhage from a peptic ulcer: above, in a man aged 53 and in figure 3 in a youth aged 17. Note the slow regeneration of serum protein requiring ten days or more to return to normal. In this chart note the relative faster return of the total protein as compared with the albumin fraction; this is due to the more rapid regeneration of serum globulin.

the defect will become fatal unless promptly corrected. There seemed to be a paucity of clinical studies on the hypoproteinemia which follows hemorrhage, and we were therefore interested in verifying our experimental findings with observations in man (figs. 3 and 5). The

4. Rous, Peyton, and Wilson, G. W.: Fluid Substitutes for Transfusion After Hemorrhage, J. A. M. A. **70**: 219 (Jan. 26) 1918.
5. Kerr, W. J.; Hurwitz, S. H., and Whipple, G. H.: Regeneration of Blood Serum Proteins, Am. J. Physiol. **47**: 356 (Dec.) 1918.
6. Cannon, W. B.: Traumatic Shock, New York, D. Appleton & Co., 1923.
7. Weiner, D. O.; Rowlette, A. P., and Elman, Robert: Significance of Loss of Serum Protein in Therapy of Severe Burns, Proc. Soc. Exper. Biol. & Med. **34**: 484 (May) 1936.
8. Elman, Robert: Acute Hypoproteinemia Following a Single Severe Hemorrhage in the Fasting Dog, Am. J. Physiol. **128**: 332 (Jan.) 1940.

same slowness in the return of plasma proteins in donors giving blood for transfusions was observed recently by Ebert, Stead and Gibson.[9]

In general peritonitis and intestinal obstruction, clinical study also revealed the frequent occurrence of hypoproteinemia, as shown in the accompanying table. In both of these diseases there is a loss of fluid (containing protein) in the walls of the intestines and the peritoneal cavity and thus the pathogenesis is similar to that presented by severe burns. Indeed, in many of these patients there is a high red cell count as occurs in burns, as shown in the table. There is, of course, considerable experimental and clinical evidence of the high protein content of the lost fluid in these and in traumatic conditions. This literature has been ably and recently reviewed by Harkins[10] and will not be mentioned further. That such local fluid loss should lead to hypoproteinemia is not surprising, yet few such observations have been made. A striking clinical example is shown in figure 6, and other cases are listed in the table.

Loss of plasma in burns, intestinal obstruction and peritonitis extends over hours and days unlike the sudden loss in severe hemorrhage, and thus the hypo-

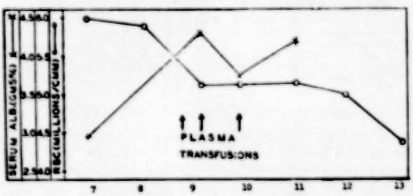

Fig. 6.—These curves of the red cell count and serum albumin concentration were observed in a 6 year old child who seven days after appendectomy had a hemoconcentration and low serum albumin coincidentally with abdominal distention and other signs of intestinal obstruction. Despite the large parenteral fluid intake she passed no urine and her general condition was critical. Following the administration of three large plasma transfusions the clinical improvement was dramatic and the recovery uneventful, including the disappearance of the distention. Note the rise in the serum albumin and the fall in the red cell count. The globulin fraction remained unchanged and is not shown. This is case 13 shown in the table.

proteinemia is associated less with surgical shock and more with disturbances in fluid balance and dehydration. Moreover, since the fall in blood volume in these conditions does not include loss of red cells, there is apt to be a hemoconcentration, unlike hemorrhage, in which there is apt to be a hemodilution. Nevertheless the important feature in common is the fall in serum protein and thus the concept of acute protein deficiency due to loss of plasma. Regardless of clinical manifestations the concept of protein deficiency, particularly as it affects the plasma, leads to the use of true replacement therapy, for it emphasizes the need for correcting the acute hypoproteinemia with protein promptly and with enough protein to correct the deficiency. As far as the blood is concerned, the most direct replacement is, of course, that with plasma itself; but its dramatic effectiveness is often missed unless enough is given. For example, most physicians will not hesitate to give a patient 2 to 3 liters of saline solution and dextrose yet will use but 250 cc. of plasma. As I [11] have pointed out before, 1 or 2 liters a day of plasma may be needed in severe burns to overcome protein deficiency in the plasma, and similar amounts will be necessary in other cases. Indeed, it is not at all unusual to have to give in the course of a day or two an amount of plasma which equals or even exceeds the patient's total plasma volume (roughly 3,000 cc.) in order to reduce the hemoconcentration, maintain the circulation and reestablish the fluid balance.

How can the physician tell how much plasma the patient needs? Following an ordinary severe trauma or hemorrhage there is usually little difficulty in answering this question, for the deficiency is due to a single loss; in most adults a liter of plasma or 2 liters of whole blood is a good initial dose, though more may be required later. When the deficiency is due to a burn, intestinal obstruction or general peritonitis, it is less easy to estimate the amount required because the loss of protein extends over several hours or days. Indeed, it is probably because of this time element that disturbances in fluid balance become important in the clinical picture of these three conditions. This, as well as increases in the red cell count, offer a much better clinical measure of hypoproteinemia particularly because inferences from the determination of serum protein are apt to be deceptive, owing to associated dehydration. In other words, frequent red cell counts and accurate estimations of the twenty-four hour intake and output, especially the amount of urine excreted, are of great diagnostic value. In general, severe serum protein deficiency is not present or is being corrected spontaneously when the adequate administration of saline solution and dextrose alone leads to a fall in the red cell count which stays down especially when a good diuresis is produced, thus indicating that normal fluid balance is being reestablished. The importance of fluid balance for surgical patients has been so well studied and emphasized by Coller and Maddock [12] that it will not be discussed here. However, it must be emphasized that fluid balance cannot be achieved if there is a severe protein deficiency, because fluid interchange through the capillaries takes a "one way" turn because the colloidal osmotic pressure of the blood falls, as already mentioned, whenever the plasma protein is reduced. In following fluid balance it should be remembered that there is usually an insensible loss of 2,000 cc. a day, which must be taken into account in estimating the intake. Ordinarily a diuresis of 1,000 cc. or more with an intake of 3,000 cc. is a good indication of normal fluid balance. The following recent experience is a simple example of the value of the red cell count and urinary output in indicating the correction of protein deficiency with a large plasma transfusion:

The patient was a 12 year old boy on whom I operated, twelve hours after the onset of acute abdominal symptoms, and relieved a tremendous strangulation of the small intestine due to a fibrous band. The next day in spite of adequate saline solution and dextrose he passed no urine and his red cell count was 6.23 million. The general condition was poor. He was given 500 cc. of plasma (10 cc. per kilogram of body weight) and within twelve hours he had passed 600 cc. of urine and his red cell count fell to 4.10 million, where it remained till his recovery.

9. Ebert, R. V.; Stead, E. A., Jr., and Gibson, J. G., Jr.: Response of Normal Subjects to Acute Blood Loss, Arch. Int. Med. **68**: 578, (Sept.) 1941.
10. Harkins, H. N.: Recent Advances in the Study and Management of Traumatic Shock, Surgery **9**: 231 (Feb.) 1941.
11. Elman, Robert: Therapeutic Significance of Plasma Protein Replacement in Severe Burns, J. A. M. A. **116**: 213 (Jan. 18) 1941.
12. Coller, F. A., and Maddock, W. G.: Water and Electrolyte Balance, Surg., Gynec. & Obst. **70**: 340 (Feb., No. 2A) 1940.

Other examples will be found by consulting the table, especially case 13, which is also represented in figure 6. In cases 9, 10 and 11 correction of the hemoconcentration followed the injection of amino acids (amigen) and in case 12 the injection of amigen was followed by a striking correction of the hypoproteinemia.

To prepare large amounts of human plasma will always present a considerable practical problem because for each liter four donors must be bled. For this reason plasma substitutes such as acacia, gelatin and pectin have been tried; they all have in common a high colloidal osmotic pressure, i. e. they exist in solution as particles of large size and thus are valuable because they simulate thereby protein behavior. Being foreign substances, however, they are disposed of by the body more or less effectively in one way or another. They cannot really correct protein deficiency but merely supply one of the important properties of protein. Animal plasma would solve somewhat the problem of practical availability, but because of protein sensitivity (allergy, anaphylaxis) has not been safe to use.

An entirely new approach to the problem of correcting protein deficiency parenterally is the use of the building stones of protein, i. e. amino acids or small aggregates thereof—polypeptides. In acute conditions this form of therapy is based on the assumption that these building stones may rapidly be built up by the body into true plasma protein, an assumption which is supported by much recent evidence. In general, the use of amino acids for the correction of protein deficiency parenterally is just as convenient as the injection of dextrose and saline solution; moreover, they supply the building stones of protein for all tissues of the body. It is important to emphasize by contrast that plasma is able to correct directly only hypoproteinemia. Because each body protein has a different amino acid composition, plasma protein must first be hydrolyzed by the body and then resynthesized before it can be used outside the blood stream.

Previous studies from this laboratory and clinic [13] have already shown that the intravenous injection of an amino acid mixture prepared by the enzymic hydrolysis of casein (amigen) is well utilized by the body and leads to the synthesis of plasma protein in chronic hypoproteinemia of dietary origin. I have also reported experiments [14] which showed definite increases in the low serum protein following acute hemorrhage by this means. In the table are listed several clinical trials with intravenous amino acids on patients with intestinal obstruction and general peritonitis. The injections were followed by excellent clinical results, as shown by improvement in the general condition, relief of hemoconcentration and sometimes by actual increases in the concentration of serum protein.

These preliminary observations are now being followed up with more detailed studies. Especially impor-

Hypoproteinemia in Patients with Intestinal Obstruction and Peritonitis

Note that changes are largely in the albumin fraction.

Case	Age	Sex	Diagnosis	Serum Albumin, Gm. per 100 Cc.	Serum Globulin, Gm. per 100 Cc.	Total Protein, Gm. per 100 Cc.	Red Blood Count, Millions /Cu.Mm.	Intravenous Fluids	Comment
Normal	..	..	.....	4.50	2.00	6.50	....	.....	
1	37	♂	General peritonitis	3.50	2.00	5.50	....	S. & G.*	Perforated appendix; 2 days after operation; recovery
2	29	♂	General peritonitis	3.60	2.40	6.00	5.56	S. & G.	Perforated appendix; 3 days after operation; recovery
3	58	♂	General peritonitis	3.20	2.40	5.60	....	S. & G.	Perforated appendix; 5 days after operation; recovery
4	2	♂	General peritonitis	3.90	2.13	6.03	....	S. & G.	Perforated appendix; 12 days after operation
			Intestinal obstruction	3.56	2.22	5.78	....	S. & G.	11 days later; increasing distention
5	14	♂	General peritonitis	4.20	2.20	6.80	....	S. & G.	Perforated appendix; 5 days after operation
			General peritonitis	3.20	2.40	5.60	....	S. & G.	2 days later; patient distended
			General peritonitis	....	....	7.80	....	S. & G.	4 days later; patient recovering rapidly
6	14	♀	Intestinal obstruction	3.22	2.39	5.61	5.5	S. & G.	8 days after onset; 2 days after operation
7	41	♂	Intestinal obstruction	3.93	2.17	6.10	....	S. & G.	8 days after onset; 4 days after operation
8	59	♂	Intestinal obstruction	4.50	2.88	7.38	....	S. & G.	Preoperative; obstruction incomplete
									Extensive resection of small intestine
				3.37	1.63	5.00	....	S. & G.	2 days after operation
				2.65	2.38	6.03	....	Amigen †	3 days after operation; recovery uneventful
9	73	♂	Volvulus	3.76	2.09	5.85	5.2	S. & G.	Release of volvulus; 7 days after operation; condition critical
				3.90	1.88	5.78	4.7	Amigen	14 days after operation; patient improving after 2 days of amigen
				3.95	2.70	6.65	3.5	Amigen	16 days after operation; patient recovering after 4 days of amigen
10	50	♂	Intestinal obstruction	....	....	4.90	6.7	S. & G.	2 weeks after onset
				2.90	1.50	4.40	5.3	S. & G.	1 day after operation; ileostomy
			General peritonitis	2.60	1.60	3.60	4.2	Amigen	6 days after operation; general peritonitis from perforation (autopsy)
11	29	♀	Intestinal obstruction	3.30	1.20	4.50	4.10	S. & G.	Preoperative, 11 days after hysterectomy
				3.30	1.60	4.50	3.63	Amigen	2 days after operation (release of obstruction)
				2.70	2.40	5.10	4.10	Blood	4 days after operation; patient improving
				4.00	2.70	6.70	4.69	.....	11 days after operation; patient nearly well
12	46	♂	General peritonitis	3.55	2.55	6.10	....	S. & G.	Closure of 24 hour perforated peptic ulcer; 2 days after operation condition critical
				3.55	2.50	6.05	....	Amigen	9 days after operation; patient improving after 2 days amigen
				4.10	2.60	6.70	....	Amigen	16 days after operation; condition excellent after 9 days amigen
				4.20	3.22	7.42	....	.....	19 days after operation, patient entirely well
13	6	♀	Intestinal obstruction	2.90	2.21	5.11	6.60	S. & G.	Distention developing 7 days after appendectomy
				4.30	2.30	6.60	5.10	Plasma	After plasma transfusions, 30 cc. per kilogram
				4.20	2.45	6.55	4.40	.....	5 days later patient recovering, distention nearly gone (see fig. 6)

* S. & G., saline solution and dextrose.
† Amigen is the trade name for the amino acid mixture used on these patients. It is an enzymic hydrolysate of casein.

13. Elman, Robert and Weiner, D. O.: Intravenous Alimentation with Special Reference to Protein (Amino Acid) Metabolism, J. A. M. A. **112**: 716 (March 4) 1939. Elman, Robert: Symposium on Fluid and Electrolyte Needs of Surgical Patient: Parenteral Replacement of Protein with the Amino Acids of Hydrolyzed Casein, Ann. Surg. **112**: 594 (Oct.) 1940; Intravenous Injections of Amino Acids (Hydrolyzed Casein) in Postoperative Patients, ibid. **114**: 1160 (June) 1942.

14. Elman, Robert: Serum Albumin Regeneration Following Intravenous Amino Acids (Hydrolyzed Casein) in Hypoproteinemia Produced by Severe Hemorrhage, Proc. Soc. Exper. Biol. & Med. **43**: 14 (Jan.) 1940.

tant in the acute conditions discussed herein is the speed with which synthesis of serum albumin can be made to occur. Only by rapid correction of the protein deficiency can many of the manifestations of surgical shock be sufficiently improved to prevent those irreversible tissue changes, especially in the central nervous system, which lead inevitably to death.

SUMMARY

Acute protein deficiency is a decisive but hitherto unemphasized factor in the pathogenesis of surgical shock and other clinical manifestations, shared in common by severe hemorrhage, burns, intestinal obstruction and general peritonitis. Hypoproteinemia confined largely to the albumin fraction is but one aspect of this deficiency, although it may be masked by dehydration. This protein defect in severe cases cannot be corrected rapidly enough by the body and therefore requires prompt and adequate replacement therapy. Because of its protein content, plasma is effective if given early and in large enough amounts. The building stones of protein (amino acids) offer another way of meeting protein deficiency. This new method of therapy has already been shown to correct chronic hypoproteinemia of nutritional origin; early trials in acute hypoproteinemia have yielded promising results.

ABSTRACT OF DISCUSSION

Dr. Alexander Brunschwig, Chicago: Recently there has been a great deal of interest in the protein metabolism of the surgical patient. At the close of the last war, shock was treated by the injection of acacia and other solutions which had an osmotic pressure. Little thought was given to their possible nutritive properties because it was felt that if the shock could be weathered the question of nutrition could be dealt with later. In the main that still applies. Our knowledge of protein metabolism has been extended since then and there is a possibility that even a brief definite protein deficiency may tip the balance one way or another. We see patients die suddenly with advanced cancer; apparently there was not much difference in amount of malignant tissue in the body at the moment of death and a day or two previously. Necropsy fails to reveal the cause of death. It is conceivable that such sudden deaths and in other instances sudden collapses right after operation in patients who are already undernourished might be connected with some acute protein deficiency. The use of plasma is the best method for rapid correction of acute plasma protein deficiency. I believe that surgeons do not always give enough plasma or blood when there is a clearcut indication for such replacements. A transfusion of 500 or 600 cc. (that quantity seems to have been finally regarded as a standard; why it should be 500 or 600 cc. and why it isn't 400 or 700 or 800 I don't know) seems to assure the surgeon that he has done a great deal. He has done something, but often it may not be enough. If the use of larger quantities of plasma and blood obtains, the operability of intra-abdominal neoplasms especially can be considerably extended. I have used as much as 1,500 cc. of plasma and 3,000 cc. of blood in the course of three to four hours during extensive operations for intra-abdominal neoplasms. Recently in the removal of a tumor diagnosed two and a half years previously as a carcinoma of the left adrenal but which grew locally in size and had not metastasized there was infiltration of the posterior abdominal wall and the large lumbar veins were gaping and bleeding; for a time it wasn't possible to arrest this hemorrhage. In this case 2,000 cc. of plasma and 2,500 cc. of blood were used in about two and a half hours. At no time did the patient's blood pressure fall below 120 nor was there evidence of profound shock. I believe that that was due to unrestrained transfusion of plasma and blood. All gross evidence of tumor had been removed and at present the patient, a man aged 38, is back at work.

Dr. H. N. Harkins, Detroit: I wish to confine my discussion to the acute protein deficiency of burns. The first clinical use of plasma in burn cases was reported by Dr. Elman in 1936. The plasma therapy of burns is one of the most important advances in the general therapy of this condition. I wish to describe a way of graphing the course of a burned patient that I have found useful in demonstrating the importance of the protein deficiency. The top portion of the chart shows the changes in the hematocrit over a period of five days, showing the very high hematocrit, a few hours after admission, of 73. Later, with plasma, the hematocrit came down and on the fourth and fifth days was actually below the normal value. This secondary anemia has been found in many burn cases. The lower portion of the chart shows the amount of plasma protein given in grams at various intervals. This particular patient received doses of plasma of 4,400 cc. in the first thirty hours after the burn. The middle portion of the chart is the one to which I wish to draw special attention. The plasma protein change in grams per hour is calculated from the plasma deficiency plus the plasma that has been given, so this is the net plasma protein loss in grams per hour. The plasma deficiency is calculated from my own formula, namely that in a burn case 100 cc. of plasma is needed for each point for which the hematocrit exceeds the normal of 45. Thus if the hematocrit is 73 at this point the patient needs 2,800 cc. of plasma. In following this graph, one can see that at the first reading the patient was losing plasma protein at the rate of 44 Gm. per hour. Later the loss was 16 Gm. per hour, and then on the third day the neutral point was reached, indicating that the capillaries had regained their normal permeability. This rapid loss of 44 Gm. per hour is especially important when one notes that the patient was calculated to have in his entire blood plasma only 208 Gm. of plasma protein. With this rapid loss of 44 Gm. an hour the patient could not go long before he might lose a large proportion of all the plasma protein he had. These charts demonstrate two points: (1) the early rapidity of the loss of plasma protein, which indicates the necessity for prompt treatment if the patient's life is to be saved in severe cases; (2) a point which has already been emphasized by Dr. Elman and by Dr. Brunschwig, that large doses of plasma or of plasma protein are necessary for restoration. It is no more logical always to give a burned patient a pint of plasma than always to give a diabetic patient only 10 units of insulin. The plasma dosage should be chosen to fit the patient.

Dr. Robert Elman, St. Louis: Since there are various types of protein hydrolysates which may be available for intravenous injections, I should like to put on record what I think are four criteria for their use: 1. These hydrolysates must be prepared from complete proteins and contain all the essential amino acids. 2. The method of hydrolysis should be such as to lead to a product which contains enough of all these essential amino acids. 3. When supplied as the sole source of nitrogen, the product must satisfy each of the following three biologic needs: (*a*) produce satisfactory growth in young animals, (*b*) result in positive nitrogen balance and (*c*) achieve serum albumin regeneration in depleted animals as a result of protein deficient diets. 4. When used intravenously they produce no anaphylactic or other untoward reaction.

Venereal Disease and Open Prostitution.—For the eighteen month period prior to the closing of the houses [of prostitution] a total of 358 gonorrhea cases were admitted to the Vancouver (British Columbia) Clinic. For the eighteen month period following the closing there were only 100. For the eighteen months during which the houses were open, 88 of these cases originated in houses of prostitution and 270 originated outside such houses. For the eighteen months following the closing, only 12 cases originated with professional prostitutes. But note this: The number of cases originating outside houses of prostitution also dropped—from 270 to 88. Thus, even clandestine contacts and their attendant infections decreased in the community following the closing of the houses of prostitution.—Broughton, P. S.: Prostitution and the War, Public Affairs Pamphlet No. 65, Public Affairs Committee, Inc., New York, 1942.

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BRONCHOSCOPY IN THE DIAGNOSIS AND TREATMENT OF BRONCHIECTASIS IN CHILDREN

D. E. S. WISHART, M.D.
TORONTO

Bronchography for the purpose of demonstrating the location and severity of bronchiectatic lesions was first used at the Hospital for Sick Children, Toronto, in December 1927. Difficulties were encountered, but these were overcome cautiously and gradually. The accepted procedure as now provided weekly by the ear, nose and throat service is submitted as a contribution in the refinements of the treatment of bronchiectasis in children.

It is our practice to put iodized oil into the lungs by means of the bronchoscope under general anesthesia. This has been of great value in diagnosis, and the recognition of this has had important results. The diagnosis in great numbers of suspected cases has been determined and thus clinical diagnosis has been improved. Bronchiectasis now is frequently diagnosed, and the number of cases that are labeled either chronic bronchitis or unresolved bronchopneumonia has become proportionately less.

In the last thirteen years 433 cases have been diagnosed as bronchiectasis and 1,015 records of these cases are here studied. I have the authority to state that the medical, surgical, pathologic, bacteriologic, radiologic and anesthetic aspects of this study have been read and confirmed by the department responsible. The heads of these departments and the members of their staffs have assisted in the preparation of this report, particularly Dr. Gladys Boyd, who has medical charge of the bronchiectatic cases.

THE MEDIUM USED

Iodized poppyseed oil was used from the commencement but other oils also have been experimented with. My associates and I found by various experiments that it was a mistake to use too thin an oil. At one period iodized poppyseed oil could not be obtained and iodized vegetable oil was substituted. The results were fairly good but the solution had the disadvantage of spoiling readily and thus becoming a worry to those who were using it. Iodized poppyseed oil is now manufactured on this continent and is again being used. All the illustrations were made with this oil.

TYPE OF CASE

Children of every age, as shown in the accompanying table, from infancy upward and with the severest types of bronchiectasis have been investigated and treated. Patients are sent to us who previously would have been considered very poor anesthetic risks. Bronchoscopy is done on them because the medical service is convinced that the procedure is of such benefit to the patient that the risk must be taken. The child who is now physically our greatest triumph originally had suction applied when he had a temperature of 106 F. and was exuding extremely thick pus. During the poliomyelitis epidemic 1 severely ill bronchiectatic patient was treated while in the Drinker respirator. This boy is well and has not required suction for several years. Bronchography has been done on patients under 2 years of age and suction on patients under 1 year of age without any complication.

The great majority of children are admitted the afternoon of the day before and discharged the day after injection of iodized oil.

PREPARATION OF THE PATIENT

In the early years of our work sedatives were given before operation. We gradually learned that better results were obtained when they were withheld. Now a sedative is omitted because the success of the procedure, as will be apparent, depends in part on an active cough reflex.

METHOD OF BRONCHOGRAPHY

The patient is placed on the table on his side with the diseased lung dependent. This position is of assistance to the anesthetist, for during the induction of anesthesia the patient's cough reflex is stimulated and quantities of secreted fluid are coughed out. The induction is continued until an anesthesia is reached deep enough to allow the introduction of the bronchoscope without any damage to the patient or embarrassment to the bronchoscopist. Then the patient is turned on his back and the bronchoscope inserted.

Bronchiectasis

Age When Diagnosed	Clinical Diagnosis Only	Proved Cases		
		Found at Autopsy	By Contrast Medium	By Lobectomy
Under 1 year	6	16	2	..
2	20	..	10	..
3	16	..	11	..
4	18	..	12	..
5	17	..	16	1
6	17	..	24	..
7	19	..	38	..
8	22	..	26	1
9	8	..	15	1
10	14	..	20	..
11	10	..	19	..
12	12	..	17	..
13	2	..	14	..
14	3	..	6	..
	184	16	230	3

A suction tube through the bronchoscope is used to clear the trachea and the main bronchi. The anesthetic (ether vaporized by a current of oxygen) is continued through a rubber tube attached to the anesthetic arm of the bronchoscope. Now the depth of anesthesia is diminished to permit deeper respiration and cough. This favors the expulsion of exudate from the distal portions of the bronchial tree. The surgeon draws this away as it appears. Gradually the bronchi become clearer and clearer and eventually he inserts the bronchoscope as far down each main tree as he considers it safe and advisable and aspirates through a suction tube the material he finds.

When no more material is being coughed out of the bronchial tree the anesthetist increases the depth of anesthesia to the degree which he considers advisable for bronchography. This process is accelerated by heating the ether vapor with hot water. The surgeon can further hasten the performance by occasionally putting his thumb over the proximal end of the bronchoscope during inspiration and taking it off during expi-

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Read before the joint session of the Section on Laryngology, Otology and Rhinology and the Section on Pediatrics at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

ration. He will do this in cooperation with the anesthetist and act according to the latter's wishes. When the coughing has stopped and all visible exudate has been removed, the patient is ready for the injection of the iodized poppyseed oil.

Failure to have removed the exudate will result in poor filling of the bronchi.

Fig. 1.—Frame carrying a stretched canvas which, placed on the ordinary x-ray table, greatly facilitates bronchography.

The depth of anesthesia now reached must last from three to five minutes. The suction tube is removed. The room is darkened and the radiologist, placing the fluoroscopic screen above the patient's chest, notes the position of the distal end of the bronchoscope, which is pulled back or advanced as he desires. The tube is inserted until it is seen just to project beyond the end of the bronchoscope. Iodized oil is then injected by the surgeon's assistant through a syringe, which has a special nozzle that locks into the tube. The injection is done slowly and steadily. Burrell's syringe or some modification of it is excellent for the purpose, as with it the speed of the injection is under control at all times and no oil escapes to embarrass the operator.

The oil is introduced into the part of the bronchial tree specified by the medical service. Injection of the right or the left lower lobe is usually requested. The adequate injection of the upper lobe is fraught with great difficulty. The injection of the right middle lobe is not so difficult but also requires a special procedure.

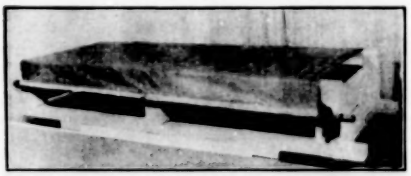

Fig. 2.—Another view of the frame. Plates or films can be placed under the patient and removed freely without any disturbance of the patient.

The word injection has been used, but the term is a poor one. The iodized oil is ejected from the syringe by controlled force but should find its way gently out of the end of the tube into the bronchus. Inspiration by the patient carries the oil from the main bronchus to the smaller bronchi and from there into the bronchioles. These parts fill only if sufficiently clear of secretion and if this part of the lung expands with inspiration. In extreme bronchiectasis the tissues are fibrosed and the affected lobe no longer expands with inspiration: consequently the cavities must fill by gravity and gentle pressure. It is an absolute mistake to inject the iodized oil forcibly into any part of the bronchial tree.

The mere introduction of iodized oil into the bronchial tree is not sufficient. The oil must reach the diseased portions of the bronchi in sufficient quantity and remain there long enough to enable the radiologist to make the necessary exposure.

During this procedure the radiologist is watching the fluoroscope and, when he notices that sufficient iodized oil has been put in to fill the area desired, the injection is stopped.

The fluoroscope is removed, the room lights are turned on and the bronchoscope is pulled back into the trachea. Two anteroposterior roentgenograms are taken. Then the bronchoscope is removed. The patient is turned on the side with the injected lung downward and two lateral films are taken. The earlier roentgenograms are more likely to be perfect than the later ones owing to the lightness of the anesthetic. As the effect of the anesthetic passes off the patient tends to cough and also to breathe more quickly; hence it is important that the facilities should permit pictures to be taken as rapidly as possible.

Figures 1 and 2 show the apparatus designed by Dr. A. H. Rolph, radiologist to the hospital, for use in this work. The sympathetic cooperation of all who are concerned is required for success. Obviously bronchography on some patients is relatively easy and on others desperately hard. This makes the timing, cooperation and team-play all the more important. The surgeon must not commence the injection until the anesthetist signifies readiness. The anesthetist must maintain the anesthesia for the time required. The radiologist must make his exposures and consequent changes of film with the least possible delay.

INFORMATION OBTAINED

In 230 of the proved cases, bronchiectasis was demonstrated on the right side only in 72 cases, on the left side only in 98 cases and on both sides in 60 cases. With the 3 exceptions noted elsewhere, iodized oil had been injected into the side suspected to be normal before major surgery on the grossly diseased side had been permitted. Information regarding all the lobes of both sides had been obtained prior to resorting to major surgery.

Bronchoscopy in some instances has confirmed the clinical observation that the disease was hopelessly severe. Certain of these have progressed to a fatal termination. Some undoubtedly had their lives prolonged by bronchoscopic suction.

COMPLICATIONS AND ERRORS

In the early years of this work laryngeal edema frequently followed. Now it rarely occurs except in babies, for we have learned to make it a rule to use a bronchoscope which is relatively small for the patient. We never use a size larger than 5 mm. in diameter.

The total number of embarrassing complications following 1,275 injections of iodized oil or suctions in cases of bronchiectasis was 7. These consisted of laryngeal reactions sufficient to cause severe embarrassment in 4 cases and to require tracheotomy in 3. Only one death that can be ascribed to injection of iodized

oil occurred in the entire series. It happened in the early years of this work. After the injection the girl, aged 8½ years, required tracheotomy, from which she recovered. The oil liquefied the pus and the quantity of the latter increased so greatly that it became impossible to remove it by suction. When we suspect that a patient is so loaded with bronchiectatic secretion we no longer advise bronchography. Instead, the patient is first subjected to a long period of postural drainage during which suction drainage is occasionally performed under anesthesia.

Some patients have so much thick pus that a good picture cannot be obtained.

Nearly all these complications occurred in the first few years of our work. Experience has shown how they may be avoided. Our record of 1,268 injections and suctions without serious embarrassment is proof that information for the medical and surgical services is being obtained with only slight risk to the patient.

The hazard of any bronchoscopy is greatly increased by a previous but recent bronchoscopy by unskilled hands. When such has occurred it is wise to postpone bronchoscopy for at least four days to allow for possible traumatic edema to subside.

Overfilling of any part of the lung renders the roentgenogram useless for visualization. It may be caused by putting the tube containing the oil tightly into a bronchus. This error may be avoided by following the directions already given. It may be caused by injecting the oil too rapidly. The speed of injection should be regulated by the radiologist as he watches the fluoroscope. Overfilling may be caused by continuing the injection after the radiologist has signified that there is enough injected for his purpose.

If the team play has been good an active cough reflex will be returning directly after the last roentgen exposure has been made. The patient is now lying on the side into which the iodized oil has been injected and suction of the throat is used to aspirate what is coughed up.

The iodized oil remains in the bronchial tree for various lengths of time. Patients with a loose cough empty themselves quickly. Patients with no cough often retain the iodized oil for two to three weeks. Patients with a normal bronchial tree may retain small amounts for many months.

FALLACY TO BE AVOIDED

Of 433 cases in which bronchiectasis was diagnosed clinically, 230 have been confirmed by iodized poppyseed oil. In 88 iodized oil was not injected. In 115 the diagnosis was not confirmed by iodized oil. But this does not mean that the clinical diagnosis was incorrect.

In many of the cases not proved by a contrast medium, bronchoscopy revealed a localized lesion in the bronchial tree or disclosed hemorrhage and thus confirmed the clinical diagnosis.

The absence of evidence by contrast medium of dilatation in a lung clinically bronchiectatic does not in itself rule out bronchiectasis of considerable extent. Three roentgenograms of the same patient illustrate this point (fig. 3). The first (*A*) demonstrates slight but definite cylindric dilatation; the second film (*B*) shows practically no cylindric dilatation, but in the third (*C*) my colleague Dr. Strachan successfully demonstrated by injection of iodized poppyseed oil still more cylindric dilatation than was originally shown. These x-ray views were taken of a patient with clinically stationary bronchiectasis. They do not indicate that the patient improved and then got worse again. They do not indicate that the size of the cavities changed. They show that cavities which are inadequately emptied will fill incompletely with iodized oil. They are presented to indicate that if the pus is extremely thick or if the surgeon does not take adequate pains the presence of bronchiectasis may not be shown.

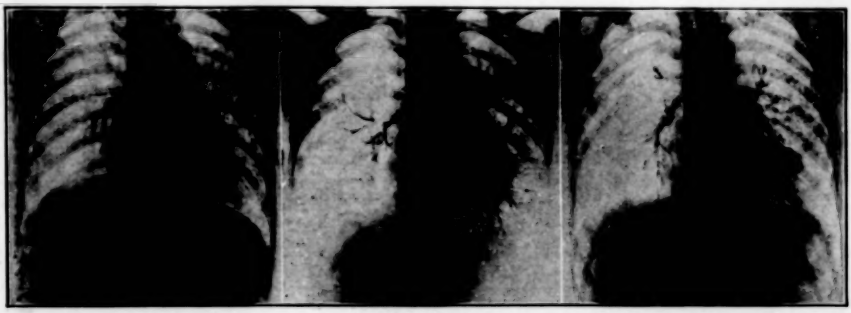

Fig. 3.—Bronchograms of a patient with clinically stationary bronchiectasis.

After bronchography it is occasionally possible to state categorically that a bronchial tree is normal. Inadequate visualization of any part prevents such assertion. The criterion is normal filling with normal outline. The delicate tracery of the normal bronchial tree is beautiful and unmistakable.

The absence of iodized oil in any part is an indication that the part may be abnormal. An abrupt blocking of a bronchus demands investigation of the area that lies beyond. Abnormality of outline is an indication of abnormality but does not prove that such picture is the complete picture of the abnormal area. This point has been demonstrated over and over again in our work and is the excuse for my providing another illustration.

The accredited literature contains a report of an extreme degree of bronchiectasis developing in an adult in six weeks, which I believe is an erroneous conclusion arising from neglect of this very point. I believe that had investigation been performed by the method we advise and with the care we urge, the presence of bilateral basal bronchiectasis would have been demonstrated before the lobectomy.

Three roentgenograms (fig. 4) are shown of a boy aged 6 years with clinical signs of chronic bronchiectasis. At the first bronchography a great quantity of purulent material was coughed up and a considerable quantity was sucked out before *A* was made, but it was obviously not a satisfactory picture. For the next two months postural drainage was instituted.

At the second operation the same surgeon took more care to aspirate the bronchial secretion before he injected iodized oil. The result (*B*) was the demonstration of cavities very much larger than those originally portrayed, but again the medical service was not satisfied with the picture.

On the third occasion, the anesthetist and a different surgeon, profiting by the two previous trials, took still greater pains. Suction was continued for twenty minutes or more. The result was a much truer picture (*C*) of the condition of the left lower lobe.

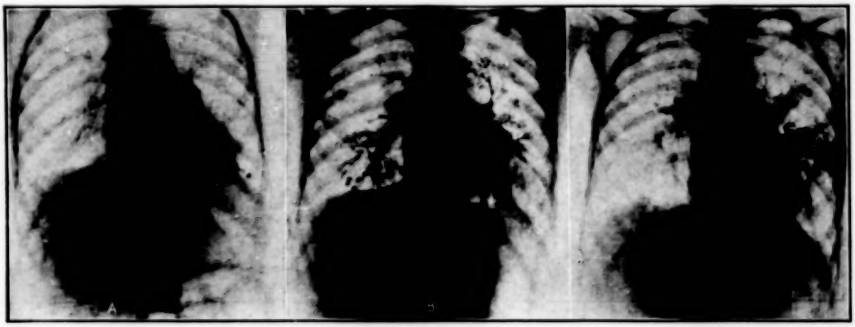

Fig. 4.—Bronchograms of a boy with clinical signs of chronic bronchiectasis.

This series has been shown to demonstrate that bronchography requires cooperation between all services in order that a true picture of the condition may be obtained. It also shows that as the result of time and injection of a contrast medium the diseased cavities of the bronchi had become much cleaner.

We have never observed—apart from the accidental inhalation of a foreign body or following an attack of whooping cough or bronchopneumonia—undoubted bronchiectasis subsequently portrayed in a lung previously undeniably normal, but we have seen it eventually demonstrated in cases in which the early contrast medium pictures could be considered possibly but not definitely normal.

CONTRAINDICATIONS

Babies under 1 year of age and all bronchiectatic children with local bleeding areas are, with rare exceptions, unsuited for bronchography. Three patients had bronchiectasis confirmed by lobectomy; iodized oil was not injected because of the local condition found in the bronchial mucosa by bronchoscopy.

SURGERY

Major surgery has accounted for all the cases listed as cured. The operative technic has improved so much from the early years that the mortality rate which was high has now become almost nil. In the last ten years only one fatality has followed lobectomy and/or pneumonectomy.

SINUSITIS

I had hoped to make statements supported by figures regarding the relationship of bronchiectasis and sinusitis. The diagnosis and its recognition and the success of treatment of sinusitis vary with the clinician, and agreement regarding the results is almost impossible to obtain.

It has been deemed wise, therefore, only to make statements regarding the relationship which meet the general agreement of the services involved.

Many of our series had infections of the upper respiratory tract from early infancy—and for these it is possible to argue that the infection antedated the bronchiectasis and, therefore, may have been a cause. In many histories frequent head colds were denied. (By far the most frequently recurring statement was that the patient's cough had originated with an attack of whooping cough or pneumonia.) We have no evidence from autopsy material to show that sinusitis has been present in even a small percentage of the bronchiectatic patients.

In the preparation of this paper many cases suspected of being bronchiectasis have had to be eliminated because the subsequent records have shown that they were cases of bronchitis associated with infections of the upper respiratory tract and that cure or alleviation has depended on the success or otherwise of the treatment of those infections.

Out of 433 patients only 84 have been reasonably proved to have sinusitis of any degree—an incidence of 19 per cent. The ultraconservative would make this percentage smaller. On the other hand, the medical service believes that many patients in this series have had sinus treatment in the outpatient clinic and that the percentage that has been quoted is far too small. The medical service insists that clinical cure of certain severe bronchiectatic children was not achieved until their maxillary sinusitis had been improved by radical operation.

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Our early policy was to postpone ear, nose and throat consultation until after the demonstration of bronchiectasis by bronchography; but now that we know that treatment of any sort (short of major surgery) does not remove or diminish the size of the bronchiectatic lesions, our policy has changed. We now consider ear, nose and throat consultation an essential part of the initial examination of a bronchiectatic patient.

FOREIGN BODIES

In 15 of the 230 cases proved by bronchography, the bronchiectasis followed the inhalation of a foreign body: 6 into the right and 9 into the left bronchial tree. Several of the foreign bodies were unsuspected: a timothy top, a tooth, an apple seed and the rubber from a pencil; a second timothy top in an abscess pocket close to the pleura was discovered after lobectomy. Unsuspected foreign bodies are sufficiently frequent to make bronchoscopic examination imperative in every case of bronchiectasis.

PATHOLOGY

Material for the study of bronchiectasis has been obtained from 41 cases: 18 surgical and 23 autopsy specimens. Studies of a portion of this material have already been reported by Erb,[1] the hospital pathologist. The typical lesion in chronic bronchiectasis is a series of dilated tubes or sacs traversed irregularly by ridges or folds so that the true lumen of the bronchus or bronchiole is its narrowest portion. This helps to explain the difficulty in draining bronchiectatic secretions. Bronchi thus diseased vary in size from minute dilatations to huge sacs and may have shapes variously described as cylindric, varicose, globular and fusiform.

The primary lesion is an infection of the bronchial wall with ulceration of epithelium and destructive changes extending into the supporting structures with subsequent dilatation. When these changes occur in the larger bronchi they can be seen through the bronchoscope. Lesions such as these may develop quickly after occlusion of a bronchus by a plug of secretion or by a foreign body.

Bronchiectasis in an atelectatic lobe with a triangular basal roentgen shadow injected with iodized oil has been reported and discussed by Boyd.[2] A history of hemoptysis was obtained in only 21 instances. The distribution of the lesions demonstrated has already been mentioned.

BACTERIOLOGY

A small light bottle inserted in the suction apparatus close to the suction tube has been used in about half the cases to collect a specimen of the material in the bronchi. The character and quantity of the bronchial secretions coughed up or aspirated during the bronchoscopy are valuable evidence of the state of the lesions. Examination consists in estimation of the amount of this material coughed up during induction and that suctioned; the direct smear is searched for pus and bacteria, and twenty-four and forty-eight hour cultures are made to determine the organisms present.

The results of the cultures are as follows: hemolytic streptococcus 306, "mixture" of organisms 292, Streptococcus viridans 192, Staphylococcus aureus 128, Bacillus influenzae 126, pneumococcus 62.

Bronchial stenosis from pressure by tuberculous glands caused the bronchiectasis in 3 cases.

Specific bacteria have not been found. In the majority, not only was the infection mixed but the flora varied from time to time in the same patient. Our conclusions are still the same as reported by Erb:[1] "The bacteriology of bronchiectasis is the bacteriology not of the chronic bronchiectatic lung but of the bronchopneumonia or other acute respiratory disease which marked the onset of symptoms."

MORTALITY

In the series of 433 cases of bronchiectasis studied there were 29 deaths. Sixteen of these were of babies with an overwhelming infection (in 13 of them bronchoscopic studies were not made) and bronchiectasis was a postmortem finding. One case was ascribed to our diagnostic procedure. Five followed lobectomy at longer or shorter periods about ten years ago. In the remainder there was such advanced disease that treatment was of no avail.

TREATMENT

The treatment of bronchiectasis in this hospital has been reported by Boyd.[3] Only points germane to this paper are dealt with here.

A patient with bronchiectasis is prone to suffer from repeated reinfections of his bronchiectatic lesions and from repeated attacks of aspiration bronchopneumonia. Control of infection in the sinuses is indicated. Drainage of the bronchial tree must be maintained until ulceration is healed. When the bronchial mucosa becomes reinfected suction must be used as often as necessary in conjunction with postural drainage until the infection is again eradicated. Each case is a law unto itself.

In some instances these measures produce such freedom from symptoms that the parents will neglect or even refuse to bring the child for examination. Of the patients Dr. Boyd has been able to follow she estimates that 4.1 per cent are worse, 80 per cent are improved and 4.4 per cent are cured.

Only those patients who have had the diseased lung removed surgically have been listed as cured. But many patients considered improved are clinically cured; that is, they are symptom free and the parents are pleased to feel that there is no necessity to bring the child to the hospital for observation.

Surgical removal of the diseased lung offers the only cure in cases of advanced bronchiectasis.

Bronchography plays a great part in the proper selection of cases suitable for lobectomy. The bronchial tree must be mapped accurately, since cases presenting bilateral lesions are absolutely unsuitable and pneumonectomy rather than lobectomy is required if the whole lung is diseased.

The condition of the bronchial tree must be known before operation is arranged. Lobectomy is contraindicated when the bronchial tree presents active ulcerations and granulations. Only bronchoscopy can give the necessary information. The surgeon desires to know that the patient has the minimum amount of septic material in his lung. Only bronchial suction shortly before he plans to operate can give him this knowledge.

1. Erb, I. H.: Pathology of Bronchiectasis, Arch. Path. **15**: 357 (March) 1933.
2. Boyd, Gladys L.: Lobar Collapse in Children, J. A. M. A. **105**: 1832 (Dec. 7) 1935.
3. Boyd, Gladys L.: Bronchiectasis in Children, Canad. M. A. J. **25**: 174 (Aug.) 1931.

IODIZED OIL IN TREATMENT

In a certain percentage better emptying is obtained when iodized oil is injected at the time of suction, and the patient can then go for a longer period between suctions. The statement is frequently heard that the child does better after treatment on Tuesday (the day iodized oil is injected) than when done on one of the other days of the week (when only suctions are performed).

CONCLUSION

We believe that bronchoscopy, together with bronchoscopic suction, injection of iodized oil under general anesthesia and bronchography has proved of unquestioned benefit in the study and treatment of bronchiectasis in children. These procedures determine which children are suitable for the only cure known—major surgery. These preliminary studies disclose the cases in which major surgery is contraindicated. The degree of the existing disease is ascertained. Bronchoscopy provides the most effective form of treatment of the large group which does not require major surgery. Bronchography permits the early definite diagnosis of the disease and, therefore, affords the great hope that the further progress of a most devastating disease can be checked.

170 St. George Street.

ABSTRACT OF DISCUSSION

Dr. Louis H. Clerf, Philadelphia: I wish to compliment Dr. Wishart on his presentation. I believe we are agreed that the frequency of bronchiectasis is not too well recognized by the medical profession and that it is a serious condition, with high morbidity and mortality rates. I have been viewing these cases from the standpoint of the bronchoscopist, and I can certify to what Dr. Wishart has said, namely that bronchoscopy is not a serious procedure either as a diagnostic or as a therapeutic aid in children. Further, the instillation of iodized oil for diagnosis is a safe procedure in spite of an occasional untoward effect. The use of iodized oil is, after all, an absolute necessity in diagnosis. One can make a diagnosis of advanced bronchiectasis by bronchoscopy, by roentgen examination or on the clinical findings alone. The difficulties are greater in the early case. It is the early case in which we are particularly interested, since it is in this case that successful therapy can be instituted. The question of anesthesia, local or general, and the employment of a sedative is a personal problem. I use local anesthesia with sedation. The important factor is to use iodized oil for diagnostic purposes to ascertain if bronchiectasis is present, to determine its extent and degree so that surgical treatment may be carried out. This is the only method of therapy that offers anything in these cases. An occasional patient has recovered from bronchiectasis after conservative medical therapy but for a majority of them the prognosis is not good without surgical treatment.

Dr. D. E. Staunton Wishart, Toronto: I want to assure Dr. Clerf that before any major surgery is attempted, not merely the diseased lobe is mapped, but all the other lobes of the lung are mapped. In making a synopsis of my paper for presentation this morning, that was one of the points I had to leave out. One of the members has asked how much iodized oil is used. I use about 15 cc. on the average child. I want you too to appreciate that we are working on children, not adults, and if you noticed the table, the great mass of the children are under 7 years of age. Our medical and surgical services desire exact information regarding these little people. I sincerely believe that I am offering something in suggesting that the work be done under general anesthesia.

INTER-AMERICAN MEDICAL RELATIONSHIPS

MORRIS FISHBEIN, M.D.
Editor of The Journal of the American Medical Association and of Hygeia, the Health Magazine
CHICAGO

In its development throughout the world, medicine has passed through innumerable transitions from country to country, from subject to subject, from leader to leader. The reasons for such continuous transition have been perhaps largely economic but no doubt also spiritual. Science is a jealous mistress. Medical science is most jealous of all. It demands freedom of thought, concentration of interest and cooperation of all the related sciences. Cradled in Greece, the youth of medicine was no doubt spent in Rome, its adolescence in the Oriental nations, perhaps the first few years of its maturity in Germany and Austria. Today its finest offspring seem to be coming from America.

With a note of sadness one contemplates the destruction of all that was great in the medicine of Germany and Austria, the devastation of the medicine of France, the starvation of the medicine of Italy, the destitution even of the medicine of England. Yet that very situation gives to scientific medicine in the United States and in all the American nations an opportunity for progress beyond anything that has ever been available before. Let us not lose that opportunity.

The epochs of medicine and its advancement have been related to certain definite fields of investigation. One may point to periods known as the period of anatomy with Vesalius and the Italian school as its leaders, the period of physiology with Haller and Morgagni as its protagonists, the period of general medicine with Sydenham and Boerhaave; then the epoch of pathology with Virchow, the period of bacteriology with Pasteur and Robert Koch, next chemotherapy with Paul Ehrlich, and closely thereafter the vitamins, the hormones and the new chemotherapy. In this last stage of advancement many of the most notable contributions have been those of the Americas.

For many decades students of the American countries sought their medical education and their inspiration in the great medical schools, hospitals and clinics of Europe rather than in those of their own countries. Since the early part of the present century, however, medical education in the United States has advanced so tremendously that the schools now compare favorably with the best in the world. Moreover, the conditions associated with the war have depreciated greatly the quality of medical education in the Axis nations and have placed on the medical schools of the United Nations other than those of the Americas burdens which represent the most that they can possibly carry.

Many of the schools of medicine in the South American nations have also been improved tremendously in recent years, and special types of work which they are capable of offering cannot be found anywhere else in the world.

Opening address in the Session on Health Problems of the Americas before the Institute of Inter-American Affairs, Columbia University, on the occasion of the four hundred and fiftieth anniversary of the discovery of the Americas, New York, Oct. 12, 1942.

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An interchange of medical students has therefore already been started and will no doubt be greatly extended in the years to come. For instance, late in 1941, thirty-seven interns representing fifteen nations of South, Central and Caribbean America arrived in the United States to spend a year in the hospitals and medical schools of this country. The sponsors for this education included the Office of the Coordinator of Inter-American Affairs, the Pan American Sanitary Bureau and many of the leading American universities. The John Simon Guggenheim Memorial Foundation announced in 1941 twenty scholarships to Latin American scholars and artists for one year of study in the United States. Nine of these were in medical and related fields. They offered opportunity to young men of South American institutions especially well qualified to study problems in the field of neurology, endocrinology and physiology in leading institutions of North America.

The Commonwealth Fund of New York during 1942 offered through the Pan American Sanitary Bureau fifteen fellowships for one year's study of public health subjects or postgraduate medical courses to properly qualified students from South America. Each of these fellowships provides living allowances while the holder is in the United States, his travel costs and the costs of tuition.

The W. K. Kellogg Foundation, cooperating with the Division of Cultural relationships of the Department of State and with the Pan American Congress of Ophthalmology, has arranged to bring twenty-five physicians of Latin American countries to the leading ophthalmologic institutions in the United States for one year of special training in that field.

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Through the Coordinator of Inter-American Affairs and the United States Public Health Service twenty-two fellowships in public health and medicine for study in the United States were granted to medical graduates of 1940 and 1941 in the Latin American countries.

Early in 1942 a group of forty-two Latin American students were enabled to visit Columbia University for a period of six weeks under the auspices of the Institute of International Education. Included in this group were thirteen recent graduates of medical schools. A number of graduates of institutions in Chile also came for postgraduate courses under the auspices of the Chilean government.

At the same time many physicians from the United States have gone to South American nations in search of special information not available elsewhere. As a part of a health program recommended at the Conference of American Foreign Ministers, held early in 1942 in Rio de Janeiro, three physicians were assigned to carry on studies in Nicaragua, in Central America, in Brazil and in Bolivia.

The eleventh Pan American Sanitary Conference has just recently been completed in Rio de Janeiro, where attention was given particularly to problems of pneumonoconiosis, brucellosis, typhus, parasitic conditions, diarrheas and the degenerative diseases.

These are but the first steps in the interchange of information and education necessary to bring about cultural unity in the medical sciences on the American continent. The cutting off of our supplies of basic materials from the Far East and the demonstration that our South American neighbors may, with suitable encouragement, be able to develop adequate amounts of all these necessary substances, including rubber, quinine and many other materials, indicates that from every possible point of view the interests of the American nations must be unified. The leadership in this field, initiated by the Rockefeller Foundation, stimulated by the Pan American Sanitary Bureau and the Pan American Union and now intensified by the Division of Cultural Relations of the United States Department of State and the Office of the Coordinator of Inter-American Affairs, may be considered the necessary catalytic agent to arouse activity in all the nations intimately concerned.

PUBLICATIONS

From 1919 through 1928 the American Medical Association, aided by the Rockefeller Foundation, published in Spanish an edition of its official publication, THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. This publication was discontinued in 1928 because it seemed to have served its purpose of introducing North American medicine into the Latin American countries and also because a considerable number of subscribers indicated at that time their desire to subscribe and to read regularly the English edition of THE JOURNAL. At present there are subscribers to THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION in every one of the South American countries and more than one hundred each in Argentina, Brazil, Cuba and Mexico.

Moreover, the Health Magazine published by the American Medical Association—*Hygeia*—is widely circulated in the South American countries, particularly in Brazil, Colombia, Cuba, Mexico and Venezuela.

Especially significant also is the large subscription in Argentina to periodicals on diseases of children, neurology, dermatology, surgery and otolaryngology.

One of the difficulties in maintaining the Spanish edition of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION was the securing of the services of competent translators. In the years that have intervened since 1928, however, more and more attention has been given to the Spanish language in North America and to the English language in South America, so that the opportunity for a wider dissemination of information in the field of medical science is greater than ever previously.

CONVENTIONS

The extension of reciprocity in the dissemination of scientific medical information is encouraged furthermore by assemblages of scientific workers from all the Americas, which are becoming ever more frequent. Especially important in this connection was the attendance of guests from other American nations at the annual session of the American Medical Association held in June 1942. The presence of more than sixty physicians from Canada, thirteen representatives from Brazil, eleven from Cuba, ten from Colombia, nine from Argentina, seven from Mexico, seven from Chile,

five from Venezuela and others from Costa Rica, Peru, San Salvador, Uruguay, Bolivia and Paraguay indicated how greatly such a scientific session appeals to physicians everywhere. Many leaders from the South American nations participated in the program. There were receptions and entertainments especially planned for the guests, and many representatives of the Latin American nations urged that all future sessions of the American Medical Association feature the attendance of guests from other American countries.

Aided by the sponsorship of the Coordinator of Inter-American Affairs, twenty-one health officials from the South American nations attended the annual meeting of the American Public Health Association in 1941 and afterward traveled over the United States to study at first hand the public health methods of many of our large cities and states.

Several new publications are now being attempted with the view of cementing still further the mutual interest of the physicians of all the American countries. Many of the leading scientific periodicals of the United States now publish abstracts in Spanish, and some in both Spanish and Portuguese. Several publications designed particularly for reading in South American countries dealing with radiology and with surgery have recently begun publication and circulation. A digest publication known as *America Clinica* is now sent to some thousands of South American physicians in a venture in which the New York Academy of Medicine is largely participating. Moreover, negotiations are under way between the Office of the Coordinator of Inter-American Affairs and the officials of the American Medical Association to undertake the publication both in Spanish and in Portuguese of magazines intended particularly for extension of scientific medicine to all South American medical readers.

We in North America have for many years been greatly concerned in watching the progress of medical science, particularly research, in the South American centers. The work of the Chagas Institute in Brazil, of the Finlay Institute in Cuba, of the Biologic Institute at Butantan, of such leaders as Houssay and Ruffo in Argentina, and of Lipschutz in Chile has long been known to investigators in the field of medical science in the United States.

Regularly all the important medical periodicals of South America have been indexed and catalogued and studied in the Army Medical Library in Washington, D. C., and in the library of the American Medical Association in Chicago. Here also the *Quarterly Cumulative Index Medicus* has listed the contents and cross indexed carefully the subjects concerned in all leading South American medical publications so that their contents would be made known to investigators in similar fields throughout the world. The constant and prompt interchange of medical information is fundamental to the dissemination and rapid advancement of medical science.

The publications of the Pan American Union and of the Pan American Sanitary Bureau indicate that certain problems of the South American nations which may be as much economic as scientific demand the aid of their North American neighbors for ultimate solution. In many of the centers of the United States improvement in nutrition has been steady and of vast importance in national progress. For years we have urged that every growing child should have at least a quart of milk per day and every adult at least a pint. The consumption of milk in all the Latin American countries is admittedly too low, reaching in some places as little as one tenth of a quart per person daily and averaging perhaps one-half pint in places like Mexico City, Santiago, Chile, and other South American capitals.

The United States is perhaps overenthusiastic about vitamins and insufficiently enthusiastic about education regarding suitable diet. However, it is reported that 90 per cent of the Bolivians suffer from avitaminosis and that from 60 to 90 per cent of school and preschool children in Colombia, Costa Rica and Bolivia are subjects of malnutrition.

These are problems in which no nation has achieved perfection and in which all may be mutually helpful in finding solutions.

Good health is fundamental to human progress. The downfall of many a nation which had leadership in the world before may be definitely related to malaria, plague, cholera or smallpox. Fortunately the United States has been able to stamp out most of the great plagues which beset the rest of the world and through philanthropic and other agencies has given its help whenever possible to aid other nations in meeting these hazards. The incidence of infectious disease among the neighbors is a constant threat to the health of all. We have largely controlled malaria in the United States. We have stamped out yellow fever. Many of our largest cities are now able to report that they are free from deaths due to typhoid and diphtheria.

But now the world is aflame and we must never forget that infectious disease is one of the four horsemen that rides when wars are in progress. Today cholera is endemic in India and in Central China and it is reported that it has spread to Greece, the Balkans and Russia. Epidemic typhus fever threatens all of the Near East and has been reported in armies and prison camps elsewhere. Relapsing fever appears whenever typhus becomes a significant cause of death. Plague is prevalent in Java, India and China and has been detected among rodents in the Far West of the United States. The mosquito that carries yellow fever has been found in airplanes sailing into the United States from other nations. Constant vigilance is necessary in times like these for the protection of human health and life from such infections. Constant interchange of information from the health officials of all the Americas is necessary for the salvation of all the American people.

The Institute of American Affairs which has been going on here in Columbia University, jointly sponsored by the University and by the Inter-American University of the Air of the National Broadcasting Company, marks the four hundred and fiftieth anniversary of the discovery of the Americas. It is perhaps also a cause for congratulation that the opening sessions on this day, which commemorates the life of Christopher Columbus, should be devoted to an interest wholly humanitarian, wholly philanthropic, wholly scientific. Many of the discussions have been concerned with cultural, political and commercial subjects, but this session on the morning of October 12 is concerned with the protection of human health, the prevention of disease, the advancement of medical science and the saving of human life.

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SPEEDING HEALTH PROGRESS IN THE AMERICAS

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NEW YORK

All the American countries are moving forward from the primitive condition in which medicine was exclusively occupied with the cure of fully developed disease toward that happy state in which well organized and adequately trained specialists will devote their entire time to the government service in community health protection. As the goal is approached the medical practitioners will undoubtedly place more emphasis on disease prevention in the families under their care, which will favorably affect community health, but my remarks will apply primarily to the public health field.

For over a quarter of a century the International Health Division of the Rockefeller Foundation has been cooperating with government health officials who wish to speed up progress by investigating troublesome problems, by trying out new methods or by study and observation in other countries. Service with this organization has given me the basis for my comments.

The rate of progress in health has varied among countries. Some have crawled along, others have walked briskly, while a few have taken leaps ahead. The public health movement has nevertheless evolved increasingly according to a common pattern, as the American countries have influenced one another through example and conference and have received assistance from the Pan American Sanitary Bureau, the Rockefeller Foundation and other agencies. The rate of gain has been increasing and the successes are becoming more numerous. Must this progress now be interrupted as the world war draws personnel, funds and materials from the protective purposes of public health to the destructive forces of war? Do the Americas have to declare an armistice in the war against disease? Most decidedly not. But why?

In the first place, the warring nations themselves will realize the importance of health protection for their civilian populations and industrial workers as well as for their fighters and will undoubtedly give a preferred position to their health organizations. But there are additional unique factors which brighten the picture for the Americas. Take the International Health Division's activities for an example. There never was a time when it could respond to all the offered opportunities for cooperation in promoting health activity. With its work in continental Europe and most of Asia inhibited by the war, personnel and funds have been released for application in those parts of South America in which its activities had been previously absent or slight. At the same time a much greater financial support to cooperative health work is coming to the Americas from the Institute of Inter-American Affairs, and the Pan American Sanitary Bureau is very active. The danger of confusion and overlapping of the programs of the various agencies was evident from the first, but it has been avoided to a degree beyond expectations by the laying of plans in frequent conferences between representatives of all the agencies involved, including the government health authorities, the Institute of Inter-American Affairs, the Pan American Sanitary Bureau and the International Health Division of the Rockefeller Foundation. The desire is to make the most of an exceptional opportunity and, if wartime shortages make one kind of program impracticable, to put emphasis on development of other public health functions and the training of the needed personnel.

There are certain policies for cooperative health work which have been tried by long experience and found to be good. All plans for cooperation with a government by an outside agency should at the start provide for the termination of the assistance under conditions which would facilitate continuation by government alone. This necessitates finding and training local leaders at the very beginning, by postgraduate studies in foreign countries if necessary. The size of the project, if it is the development of a permanent health service, must be such that the country can reasonably be expected to maintain it at the level reached at the end of the cooperative period of exploration, organization and demonstration. Foreign personnel representing the cooperating agency should live at the seat of activity, learn the local language, become sympathetically acquainted with the people and try to understand the local factors which make necessary certain differences between countries in methods of organization and procedure. At the same time representatives should stand firmly for such fundamental principles as full time service to a single salaried position and adequate training for the technical men directing a service or carrying on its essential work. Any permanent activity should, if possible, be truly cooperative from the beginning to such an extent that the country benefited contributes toward the funds and its nationals play an important part.

A few examples from South America will show striking successes and will help foretell the future of public health in that region. The partial failures we can pass over as temporary incidents.

Venezuela stands out as a country which has been following the slow but sound method of training an adequate number of expert health officials in foreign schools from year to year and depending on them after their return to establish the health structure. A school for nurses is being developed so that the necessary number of public health nurses will ultimately be available.

In many other countries will be found health experts trained in foreign countries under fellowships provided by their governments, the International Health Division or other agencies and pledged to devote themselves to governmental health work. They are perhaps the greatest single asset to the public health movement, and without them increased expenditures would be largely wasted.

The most spectacular successes have been in the conquest of dramatic plagues, particularly yellow fever. All are familiar with the early announcement by Carlos Finlay of Cuba that yellow fever was transmitted by a mosquito, now known as Aedes aegypti, and the later convincing proof of this in Cuba by the United States Army Commission under Walter Reed. The control of yellow fever in many cities and countries followed, with the first great demonstrations by Gorgas in Havana and Panama and Oswaldo Cruz in Rio de Janeiro. It is less widely known that Brazil, with cooperation from the International Health Division, has in recent years so improved and applied aegypti control that its coastal cities are noninfectible with yellow fever. In fact the methods of systematically detecting and destroying this mosquito have become so efficient that

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the species can be locally exterminated at will if the will is supplemented with funds and organization, and it is now reported that in six Brazilian states and the Federal District aegypti can no longer be found. The control organization, now wholly under Brazilian medical directors, is pressing to exterminate this dangerous mosquito from an ever increasing area of their country. This success has attracted wide attention, and scientists have gone to Brazil from Europe, Africa and several American countries to see for themselves and learn.

Another discovery of worldwide significance was made in Brazil through the cooperative yellow fever work. As the coastal cities and the surrounding areas were cleared of aegypti mosquitoes there continued to be cases of yellow fever in the interior. This led to the unexpected discovery in 1932 that yellow fever could be transmitted by mosquitoes of the tropical forest other than aegypti, and even in the absence of human cases of the disease. This meant that jungle animals must be capable of multiplying the virus and infecting the mosquitoes. The basic discovery was made in Brazil, but the subsequent fruitful study of the epidemiology of the disease and its control through a method of vaccination devised in the United States of America was carried on both in Brazil and in Colombia.

The success in the local extermination of aegypti raised the hope that other dangerous mosquitoes with domestic habits could be eliminated. When the highly efficient malaria transmitter Anopheles gambiae was accidentally introduced from Africa into northeastern Brazil, it spread the local malaria until devastating epidemics with high mortality occurred. In eight years this mosquito had advanced over an area of about 12,000 square miles. A special service with staff of over two thousand men was organized. Many with experience in the yellow fever service were included. The infected area was mapped and districted, larvae were destroyed by the application of paris green, adult mosquitoes were killed by sprays in the houses and vehicles were disinsected at the boundaries of the area. Early in 1940 the control measures were stopped, and since then a diligent inspection service has been unable to find a single Anopheles gambiae mosquito. It will take great vigilance to prevent the reentry of this unwelcome invader into the Western Hemisphere, for dead gambiae have been collected after the spraying of planes coming to Brazil from Africa, and any slip in the precautions might reinfect South America. The complete extermination of this species has no parallel in public health experience, although there have been somewhat similar successes in the field of agriculture.

These few examples of health work in South America cannot but convince us that, if such appalling health menaces can be promptly studied and conquered, the other health problems of the Americas will be solved in due course. The time may soon come when a greater appreciation of what is being done in the health field in South and Central America and the West Indies will result in an increase in the number of men going from the United States of America to the countries of the south to study disease prevention, particularly with the present awakened interest in tropical diseases.

What of the future? As success rewards the efforts to meet our present disease problems, standards will rise and new problems will appear or old neglected ones will become more important. As populations increase and travel becomes more rapid, greater precautions and more effective methods will be necessary to curb infectious diseases and to keep from spreading dangerous insects. All these demands can be met only through scientific research and effective organization. Successful results will come faster if the pace now stimulated by war is not allowed to slow down with the advent of peace.

The first health duty of every American country is to see that the minima of standard health precautions are met by their communities. These minima should include safe piped water available throughout the day and night in every home or place of work, adequate sewerage and competent health supervision. Such supervision will require medical health officials with postgraduate training in public health, bacteriologists, public health nurses, sanitary engineers and vital statisticians in the larger centers, and at least trained full time health officers with public health nurses in all cities and the larger towns. These smaller units will need the occasional help of central government epidemiologists and laboratory experts if they are to be ready at all times to identify and control the unusual diseases. The constant diagnostic service of a central laboratory is indispensable.

With the increased establishment of sound health organization with adequate support throughout the Americas, we can face with assurance the temporary problems raised by the war and look confidently toward levels of health and well-being as yet undreamed of.

THE EXCHANGE FELLOWSHIP

A SOUND BASIS FOR ENDURING INTER-AMERICAN CULTURAL RELATIONS

DR. JOAO JACQUES DORNELLES
RIO DE JANEIRO, BRAZIL

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It is difficult to discuss plans for the creation of mutual understanding between the Americas unless we consider first the circumstances surrounding the indifference to one another from which these two continents have suffered until very recently. The Western Hemisphere is, for the purposes of a broad discussion of our present civilization, young and vital, not yet fully aware of the enormous implications of strength and greatness which lie in our natural resources and our cultural heritage.

Both continents owe, in common, their debt of discovery to the spirit of the Renaissance which drove European adventurers to the West. From the very beginning there were, however, habits of mind and historical association bound to produce very different methods of adaptation to the environment of the new worlds of North and South America.

Here in the North there grew out of revolution, expansion and industrialization a new culture, strong as the desire for liberty itself. It may perhaps be said that this distinctive North American character began to assert itself clearly about one hundred years or better, eighty years ago, directly after the Civil War. The United States we know today has been proved a nation indivisible. It began to draw away from European influence.

But south of the Rio Grande the pattern was a different one. The countries of Latin America had maintained close ties with Europe and even until recently the development of a civilization truly Western, strengthened by the bonds of cultural exchange with

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the North, was very slow. There was, and quite naturally, a preoccupation with national problems in the United States which precluded the realization that one half of the hemisphere was almost unknown.

We are therefore dealing with a relatively new idea.

We are bent on finding a sound basis for enduring Inter-American cultural relations.

I have been asked, as a member of the medical profession and a Latin American, to discuss this subject as it is based on the exchange of scientific knowledge between the western continents. I am one of 3,400 visitors from South America this year, one of 160 doctors. Had I come fifty years ago I would almost surely have been the only one here. Even twenty-five years ago there was very little interchange of professional activity between the North and the South.

In 1914 Benedict Montenegro, now dean of the Faculty of São Paulo, came from my country, Brazil, to study at the University of Pennsylvania. In 1918 Dr. Borges Vieira and Dr. Paulo Souza were in the first class at Johns Hopkins University School of Hygiene with fellowships granted by the Rockefeller Foundation. In 1920 Dr. Carlos Chagas attended a public health conference in Boston, on which occasion the degree of Master of Arts Honoris Causa was conferred on him by Harvard University. In every country of South America there were similar cases in which doctors pioneered in the exchange of medical information.

In 1937 the Buenos Aires Convention for the Promotion of Inter-American Cultural Relations gave great impetus to the movement which had been so well begun by private individuals and the Rockefeller and Guggenheim foundations. According to the provisions of this convention, fellowships were granted to qualified representatives of every Latin American country through the Department of State. And, for the first time, actual internships were arranged by the Pan American Sanitary Bureau for visiting doctors in the finest hospitals of the United States. It is impossible to overemphasize the importance of this last provision involving internships, for the language handicap, in combination with new methods of teaching, had made it exceedingly hard for exchange fellows who were only observers to take advantage of opportunities to learn that which lay always before them but almost out of reach.

When this activity had begun to assume national proportions, the American Medical Association, which has long guarded the high standards of medical teaching and practice, undertook to encourage hospitals to accept students from Latin America. It may be a matter of conjecture, certainly a source of great hope, that one day this association will list among the requirements for accredited hospitals a provision for exchange fellowships and internships.

Most doctors who study in foreign lands mean to do postgraduate work. Many of them have already begun private practice. As a rule they cannot afford to remain away from home for more than one year. As clinical observers they encounter great difficulties when they cannot ask questions in their native languages. It is also hard for them to follow lectures, which are, however, always exceedingly helpful as they are understood.

Here in the United States postgraduate study involves three long years of intense work. To come to this country for a single year is almost a waste of time, for the course is so arranged that the work of the first year is purely preliminary, meaningless, until it fits into the program of the second and third years. It is true that any man who is able to go through the whole course will return to his native land with a solid background in his field. But if the American Medical Association could work out a plan through which visiting doctors could be exposed, in one year, to a comprehensive view of their special departments of medicine, they could then go home to continue their work along new lines. The beneficial effects of such an arrangement are numerous. First, those doctors who are well qualified but unable to afford three years away from private practice would then be able to take advantage of exchange fellowship opportunities. Then also for every one man who now studies abroad there would then be three to gain this valuable experience. And the results which would accrue from the exposure of large numbers of doctors to new ideas would, of course, advance in an arithmetical progression and so intensify interest among their fellow men in the hemispheric view of their profession.

What is true of medicine is true of every other branch of knowledge; fellowships are a vital link in the dissemination of our culture throughout the Americas.

In medicine alone there are here in the United States representatives of every country in Latin America. They are at work in some of the greatest hospitals and medical schools in the world—at Harvard, at Yale, Chicago, Ann Arbor, California, St. Louis, at the Mayo Clinic, at the College of Physicians and Surgeons, at Memorial Hospital and New York Hospital, to cite only a few. Of Johns Hopkins special mention should be made, for in years past when there was very litlte interchange among our nations it stood out like a beacon among the medical schools of the New World. By way of illustrating the rapid growth of professional good neighbor policy, one can point to the Memorial Hospital here in New York, where a great fight against cancer is being waged. When Dr. James Ewing and Dr. George T. Pack visited South America recently they found among doctors and medical students an increasing interest in the battle against cancer, and following their return to Memorial Hospital the number of interns, surgical assistants and special fellows from Latin American countries has at least doubled.

The preservation of peace and harmony is the objective toward which our foreign policies are directed. We are now employing every means available to buttress the social, political and economic structure of our hemisphere with sound cultural relations which will outlive the circumstances of an era of world conflict. Culture is a social phenomenon which draws its strength from a hundred sources, its endurance from the nature of these sources. The path along which we are now moving presents our greatest hope for a bright future for the western world.

Today we commemorate the four hundred and fiftieth anniversay of the discovery of the Americas by Christopher Columbus. It is most appropriate that we should concern ourselves with the coordination of the numerous forces which are now devoted to the cause of uniting the nations of this hemisphere.

I am honored to have had this opportunity to tell you of the cooperation which now exists among the members of my profession and to have been able to give

some small measure of credit due those organizations which have done so much for the cause of a united America.

In my work here I have merely made a beginning, for in future years I shall be able to disseminate among my people that long view which I have here acquired. This will be a pleasure and an honor of which no man could be more proud.

INDUSTRIAL AND HEALTH DEVELOPMENT IN THE TROPICS

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Health and sanitation planning in wartime takes on increased importance for the public welfare. War is destruction, whether of human life or of property. Yet at the same time it sets in motion countermeasures for protection of human life. It is one of these wartime efforts to preserve human life that I am going to discuss here. I appreciate this opportunity to tell about a phase of inter-American activity that, while developed in wartime, promises to be of lasting benefit to the Americas cooperating in this humanitarian work.

Other speakers on this program are discussing the broader phases of inter-American achievements in health and sanitation. The program being carried out by the Health and Sanitation Division of the Office of Inter-American Affairs, in cooperation with the other Americas, has the help of the work done by pioneers in tropical medicine. This program springs from the necessities of wartime development, although it aims to provide long range benefits for peace as well as to meet wartime needs. The Pan American Sanitary Bureau, the health and sanitation authorities of the other Americas, medical schools and private organizations have a notable record of accomplishment in raising health standards in the Americas.

We are grateful for the cooperation we have received from the established institutions in this field. Their experience and help have been invaluable in getting this large scale organization under way. The new program is designed to supplement, rather than supplant, the activities of the established agencies. The fruitful work of these organizations should continue to grow.

The program started by the Americas this year was recommended in a resolution passed at the Rio de Janeiro Conference of American Foreign Ministers last January. That conference, you may recall, met at a crucial time. It was summoned after the Japanese attack on Pearl Harbor. The Rio conference recommended a many sided program of cooperation for development of hemisphere economic resources, for control of anti-American activities and for defense of the Americas.

The conference proposed that the American republics take individually, or through agreements between two or more of them, appropriate steps to deal with problems of public health and sanitation. The conference suggested, furthermore, that such cooperative action be undertaken in accordance with the ability of the separate countries to provide raw materials, services and funds.

It was necessary to move fast to get this program into action. The urgency of the Rio development program soon became evident after the fall of Singapore. In the Far Eastern trade area guarded by Singapore, the United Nations lost their principal sources of rubber, quinine, manila hemp and substantial supplies of metals, vegetable oils and other vital materials. These supply losses can be replaced in part or wholly from the Western Hemisphere. But a big job of organization is involved. The Rio conference provided the framework for cooperation in the organization of hemisphere resources to produce supplies needed by United Nations war industry and for replacement of imports formerly obtained outside the hemisphere.

It was necessary to begin the health and sanitation work immediately. This program had to precede, in part, actual development work. Experience has taught the need of preparation for protection of workers in tropical areas. Besides economic developments there also was need of health and sanitation measures for defense projects. Altogether these made a formidable task of health and sanitation planning. Considering the expense, the necessity of close cooperation among governments of the Americas and the urgency of it, this program inevitably became a government undertaking.

To carry out the Washington end of the program, a health and sanitation division was set up in the Office of Inter-American Affairs under the direction of Dr. George C. Dunham. Dr. Dunham had many years of experience in tropical health and sanitation work in the Philippines and in the Americas to the south. The coordinator of Inter-American Affairs, Nelson A. Rockefeller, long had recognized the importance of health and sanitation in Inter-American relations and readily lent his support for the execution of the Rio conference recommendation.

Today the program is well under way. Parties of tropical medical specialists, sanitary engineers and other technicians are in the field in eleven of the republics to the south, collaborating with health authorities and medical specialists of those countries in many projects. Far into the interior of the vast Amazon Basin, these men prepare the way for thousands of additional tappers who will be needed to collect wild rubber for the United States market. The United States has signed agreements with fifteen of the rubber producing Americas to purchase their exportable rubber surplus. Health and sanitation projects are tied in closely with the rubber program. In Haiti it ties in with plans for growing sisal for the United States market. Likewise it connects with other developments immediately designed to aid the war effort but likely to be productive also of lasting benefits.

I have not time to discuss in detail the reasons why health and sanitation planning must be part of industrial development in the tropics. Others on this program are discussing the more general phases of hemisphere health problems. Suffice it to point out here that malaria, one of the greatest scourges of mankind, is particularly prevalent in the rubber producing areas. Malaria can be more deadly than bombs and bullets when masses of men are involved in such tasks as tapping rubber trees in tropical forests. In the first wild rubber boom in the Amazon Basin many years ago the rubber collector ranged into mosquito infested tropical forests at his own risk. What that risk meant in disease and death may be seen in accounts of the human toll taken in the feverish rubber boom before the first world war. I say feverish in a double sense, for it was permeated with malaria.

Read in the Session on Health Problems of the Americas before the Institute of Inter-American Affairs, Columbia University, New York, Oct. 12, 1942.

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Let me quote what the Brazilian newspaper *A Noite* says about malaria in an article applauding the Brazilian health and sanitation project. This article points out that malaria, starting at Bahia, spreads all the way into the state of Acre in the extreme western part of Brazil and into Bolivia and Peru. I quote from the article:

> Raging unchecked, this malady has claimed thousands of lives each year and is the chief obstacle to the development of the area. It is mainly in the vast, mysterious valley of the Amazon, from the islands of the long estuary near Belem, past Amazonas, Perus, Iaco, Madeira and Acre, that malarial fever rages at will, without shackles or organized resistance, except by the dangerous individual treatment, at best unsystematic and sporadic, of quinine.

One of the veterans of tropical medicine at work on the Amazon project is Dr. K. C. Waddell. Before he joined the inter-American project, Dr. Waddell for six years was with the Ford rubber plantations in the Amazon. This was the biggest rubber plantation project started in the hemisphere prior to the war. The experience of Dr. Waddell is now invaluable for large scale organization of such work in the Amazon territory.

From a branch field office in Manaos, deep in the interior of Brazil, Dr. Waddell and his men are working with Brazilian authorities in a campaign against malaria. It isn't a spectacular campaign compared with the drama of the front line fighting fronts in the world struggle. But it is work which is essential to development of hemisphere resources. It holds possibilities of large, though intangible, rewards in human happiness.

Malaria control is varied. It may be directed toward elimination of mosquito breeding places, mosquito proofing of dwellings, construction of screened houses, distribution of quinine or substitutes and so on. Projects in this program are adapted to local conditions. The Americas to the south are highly diversified in climate, geography, peoples. They require individual attention. Besides Brazil, health and sanitation missions have been assigned on request from these countries to Peru, Bolivia, Ecuador, Costa Rica, El Salvador, Guatemala, Haiti, Honduras, Nicaragua and Paraguay.

To illustrate the variety of work, I shall enumerate some projects. In Peru plans have been made for completion of a hospital at Tingo Maria, an agricultural research and development center on the eastern slopes of the Andes. Hospitals and dispensaries are proposed for other Peruvian towns suitably located to serve strategic producing areas.

In northeastern Bolivia, a rubber area, malaria is the chief health problem. So the sanitation of Guayara Merin was selected for the first project by Bolivian and United States medical specialists under this program. The town selected is the head of navigation on the Madeira River, one of the main tributaries of the Amazon. It is the port of entry between Bolivia and Brazil.

Work is further along in Ecuador. The work in Ecuador includes improvement of sewerage and hospital facilities in Quito, the capital; also malaria control projects near Guayaquil, the chief port of Ecuador. In Haiti, besides malaria control, sanitation work includes the construction of a rural market just outside the city of Port-au-Prince. Offhand the building of a rural market may sound remote from health planning. But the marketplace fits in well with the program. The reason is that the marketplace in Haiti is a public gathering place and one of the best points from which to disseminate health information. In Nicaragua the plans include construction of headquarters in Managua for the Nicaraguan health administration. In Paraguay a site has been obtained for a health center in Asuncion, the capital.

These examples illustrate the varied nature of the projects. They also may serve to indicate the permanent benefits that should flow from this program. These new hospitals, sewerage and market facilities and malaria control should prove valuable in peace as in war. It is wartime necessity that expedites the program. But, once under way, health and sanitation work gathers momentum, carries on long after the start.

This is proved in the achievements of such established institutions as the Pan American Sanitary Bureau, the health activities of the other Americas and of private organizations. From the projects described here, it is possible to envisage substantial benefits for the postwar as well as the war period. Many additional people in the other Americas are drawn into health work as a result of these projects. Many additional nurses and technicians must be trained. This additional trained personnel likewise may be accepted as a lasting contribution to improvement of health and sanitation conditions in the Americas. Thus amid the destruction of war there emerge new constructive forces. We may justifiably hope that these constructive forces in health and sanitation will serve as both immediate and long range influences for continued growth of inter-American cooperation and understanding.

ATYPICAL LARYNGEAL AND VOCAL CHANGES IN ADOLESCENCE

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Adolescence has been aptly termed the "fateful passage." It is a period of tremendous upheaval when, among other things, nature reorganizes the entire body to assume the function of reproduction. It is small wonder, in view of the far reaching somatic changes which occur within a comparatively short period, that many disorders are precipitated during these adolescent years. In fact, the biologic changes are so radical and offer such a plausible explanation for almost any condition which develops at this time that too often

Fig. 1.—Range of voice of patient whose likeness is shown in figure 2 before and after treatment for paraphonia.

one attributes to them disorders which are not primarily of organic origin at all but are instead largely psychogenic.

Concomitant with and indeed arising out of the somatic changes of adolescence, there is a great emotional upheaval. The child's biologic maturity makes new exactions on him. He finds himself beset by strong unconscious impulses which he does not understand and with which he does not know how to cope. The

Read before the joint meeting of the Section on Laryngology, Otology and Rhinology and the Section on Pediatrics at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

environment as well imposes new, different and often difficult demands. Frequently these demands are conflicting. For instance, parents, confused by the boy's or girl's sudden transition from childhood, are at a loss as to how to balance freedom and discipline and, too often, continue to treat the adolescent as a child, attempting to repress all expression of his increasing maturity and all his natural impulses toward independence. At the same time, the outside world expects the individual to act in accordance with his greater physical maturity. This disharmony between parental exactions and environmental demands outside the home inevitably gives rise to conflicts.

Physicians and teachers are frequently at a loss as to how to advise parents because there is no master plan for the adolescent. While it is true that all adolescents pass through an orderly sequence of growth, development and maturation, each one—depending on his nature (his inherent constitutional endowment) and the adequacy of his nurture—will pass through this sequence at his own rate. Thus there is a great variation in the rates at which the same changes take place in different individuals. Furthermore, even within the individual himself there are variations in the rates with which different functions become fully organized. Thus the whole organism is in a general state of instability as regards both its internal and its external interrelationships.

If the instability is especially pronounced, and if environmental pressures are strong, the adolescent will feel particularly inadequate to the demands which his

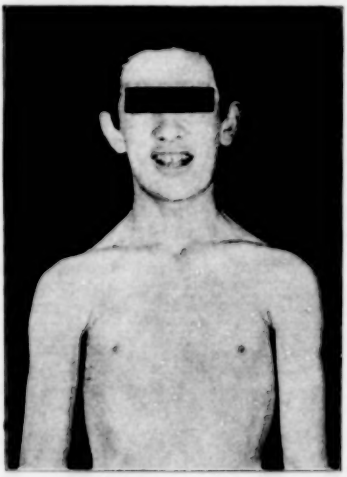

Fig. 2.—Appearance of P. W., aged 15. This patient with a falsetto voice shows no morphologic deviation from the average boy of his age.

biologic maturity imposes on him, and he may unconsciously resort to some neurotic solution. This frequently takes the form of a vocal or speech disorder. For example, the adolescent boy's voice may fail to change; the high pitch which was normal in childhood becomes abnormal in adolescence, and the condition is diagnosed as paraphonia or falsetto voice.

This disorder is usually demonstrated by the timid boy who fears the grown-up masculine role. Such a boy may protest against assuming that role by unconsciously clinging to his high, piping childish treble. Through constant use of his high voice, he causes a faulty coordination and misdirection of the laryngeal musculature, inhibiting the depressor muscles from assuming their normal dominance. Thus, the levator muscles (the suprahyoid group) retain dominance, and the larynx remains in its abnormally high position in the throat.

Fig. 3.—Appearance of J. C., aged 16, whose falsetto voice was associated with an endocrine involvement. The patient is of the eunuchoid type, presenting the typical Fröhlich syndrome with its characteristic female distribution of fat around the hips and breasts, large abdomen and underdeveloped genitalia.

Fig. 4.—Appearance of H. B., aged 26, whose falsetto voice was also associated with an endocrine involvement. While he presents an altogether different picture from the Fröhlich type, it is nevertheless apparent that, morphologically, he too is atypical.

The condition, if uncorrected, continues throughout adult life, long after it has ceased to have any usefulness as a defense mechanism. Indeed in time it becomes a definite liability, and the resulting psychic traumas have far reaching and serious effects on the personality. For instance, recently I had a patient with a falsetto voice, a man aged 50 and the father of three children, who told me that he had "suffered the tortures of the damned" and had shunned all social contacts because of his voice. I have a record of his voice before and after treatment, but, since I am discussing the adolescent, I present here the recording of a younger patient, a boy aged 15 (fig. 1), before and after treatment.

This boy was referred to me by the school authorities, who noted that, while the voices of his schoolmates had all changed, his still remained high. This was beginning to have a detrimental effect on the boy's personality.

RECORDINGS

It will be noticed that there is nothing to distinguish this patient (fig. 2) from the average boy of his age. Cases of this sort are not to be confused with those in which there is an endocrine involvement; in such cases the vocal disorder is but one aspect of the whole symptom complex. It is comparatively easy for the diagnostician to recognize the endocrine type merely by observation of the picture which the patient presents. He usually shows an apparent deviation from the so-called morphologic normal. For instance, he may present the typical Fröhlich syndrome with its characteristic female distribution of fat around the hips and breasts, large abdomen and underdevelopment of the genitalia (fig. 3). Such a patient is definitely recognizable as a eunuchoid type.

On the other hand, the patient with an endocrine involvement may be an elongated eunuchoid type (fig. 4). While he presents an altogether different picture from the Fröhlich type, it is nevertheless apparent that he also is atypical.

Another patient may present a still different syndrome—a picture of general underdevelopment. The most interesting study of this type that I have made was on identical twins referred to me by Dr. George B. Dorff of the Children's Medical Service of Bellevue Hospital. These boys suffered from cryptorchism and

Fig. 5.—Appearance of Pr. twins at the age of 7½ years. They are identical twins with cryptorchism.

had been underdeveloped in every way. I first saw them at the age of 13 years. However, they came to the attention of Dr. Dorff at the age of 7½ years (fig. 5) when their father brought them to the Children's Endocrine Clinic complaining that they were not growing sufficiently. Delivery had been normal and there was nothing significant in their infantile history. On examination they were fairly well nourished but showed definite stunting. They both suffered from cryptorchism, and the external genitalia were infantile. They were kept under periodic observation until they

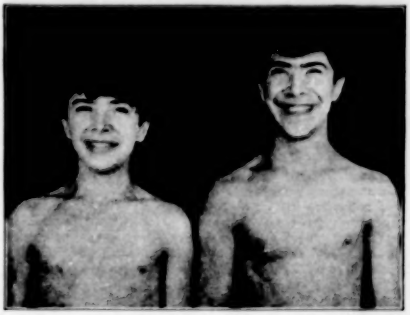

Fig. 6.—Appearance of Pr. twins at the age of 13 after one had been treated for eight months with chorionic gonadotropic substance. Although originally shorter and lighter in weight (the twin to the left in figure 5), the treated twin was now 2 inches taller and 8 pounds heavier than his brother. Normal puberal changes had taken place and his voice had become low and resonant. The untreated twin remained underdeveloped and retained his high pitched, childish voice.

were 12, during which time Richard was given desiccated thyroid with no apparent results: he showed no greater increase in height than Joseph, the control, who received no thyroid. At the age of 12 it was decided to treat one of the twins with chorionic gonadotropic substance. Since Richard was the shorter twin and weighed less than his brother, he was chosen for treatment, while Joseph was again selected as the control and given no medication. Richard was given from 200 to 500 rat units of chorionic gonadotropin three times a week until a total of 42,850 rat units had been given. At the end of eight months treatment was discontinued, and it was at this time that I saw the twins. Richard looked more mature than Joseph in every respect (fig. 6). Although originally shorter and lighter in weight, he was now 2 inches (5 cm.) taller and 8 pounds (3.6 Kg.) heavier than his twin. He was making so much better progress in school that he was promoted a class while his untreated twin remained behind. In addition, the endocrine therapy had produced normal puberal changes in Richard. And, what particularly interested me, Richard's voice had become low and resonant—it was a normal adult male voice—while Joseph's voice remained high pitched and childish.

DYSPHEMIA

Another disorder which is frequently seen in the adolescent is dysphemia, or stuttering. While in the majority of cases this disorder develops earlier in life, the general instability of the organism during the pubescent period, as well as the heavier environmental load, serves to increase its severity at this time. Moreover, the adolescent begins to realize the social implications of his stuttering, which gives a further impetus to the development of his anxiety neurosis.

It is inevitable that the child who stutters should be more than ordinarily affected by the stresses and strains of adolescence. His speech disorder is evidence that he already possesses a physiologically unstable organism, for stuttering speech is a somatic manifestation

of an emotional disorder—an emotional disorder which is, in turn, based on a constitutional predisposition to nervous disorganization. The pressures of adolescence increase this potential instability, accentuating the child's feeling of inadequacy and causing his stuttering to become more severe.

CASE 1.—D. W., aged 15, the son of a college professor, had stuttered since childhood. However, the disorder was not severe enough to disturb him greatly, and he managed to overcompensate for it by being unusually aggressive and leading his "gang" in various childhood exploits. During adolescence the stuttering speech became more pronounced, reflecting the greater instability of the organism. The patient's concern over it increased and he began to have a conscious feeling of inadequacy and anxiety. When he was referred to us, his stuttering was very pronounced.

Treatment was along our usual eclectic lines: to increase the underlying efficiency of the organism, eukinetics, rhythmics and relaxation therapy were introduced; also the patient was given both group and individual psychotherapy; in addition a certain amount of speech reeducation was introduced to break down his old fear response in speech situations and, at the same time, build up his confidence in meeting such situations. All this was supplemented by social therapy, which is an integral part of our therapeutic program at the National Hospital for Speech Disorders. When the patient returned to school, there was a noticeable change in his personality and in his speech.

PSYCHOPHONASTHENIA

A third condition which may develop in adolescence is psychophonasthenia—a pinched, grating voice with pitch irregularities, a voice that "cracks" frequently, breaking suddenly into another key or choking off completely. There is usually no local pathologic condition; if such a condition is present, it is so slight as to be entirely disproportionate to the severity of the vocal involvement. The disorder is fundamentally one of psychic origin—a symptom of neurotic anxiety—and its onset can usually be traced to some crisis in the person's life or to suddenly increased environmental pressure.

CASE 2.—S. M., aged 16, the daughter of a high school principal, developed psychophonasthenia shortly after transferring from one school to another. When questioned about her school work she confessed that she was not a good student, had "flunked" several subjects during the course of her scholastic career, and was at the time of the interview being tutored in French and English. Since, in spite of her below average scholastic ability, the patient was a senior in high school at the comparatively early age of 16, it was evident that great pressure had been brought to bear to push her ahead. She had been pushed beyond her capacity; in a sense, the child was a sacrifice to the pride of her highly educated parents.

She admitted having always been afraid of her teachers and of being "very nervous" whenever she had to recite, but she had never experienced any actual difficulty in speaking until transference to the new school environment. This change placed an added burden of adjustment on the child which the organism was incapable of withstanding. It was, so to speak, "the straw that broke the camel's back."

Since psychophonasthenia is the culmination of a neurosis which has been developing over a period of years, it is a deep-seated disorder and difficult to treat once it has become firmly rooted. For that reason an effort was made to impress on the parents of S. M. the necessity of taking the girl out of school and of having her receive treatment while the vocal disorder was in its initial stages. The parents rejected this suggestion on the ground that her graduation from high school was at the moment of primary importance and that, in any event, since the disorder had developed suddenly, the patient would undoubtedly "grow out of it." In my experience with psychophonasthenia, I have never known of a case in which there has been a spontaneous resolution, and I expect to see this patient again in a year or two, her neurotic traits much more deeply ingrained and presenting a much more difficult therapeutic problem.

HYSTERICAL APHONIA

Another vocal condition occasionally seen in adolescence, particularly in adolescent girls, is hysterical aphonia—sudden loss of voice due to psychic conflict. It is usually an unconscious means of escape from something in the environment which is distasteful or which threatens the person's security or happiness.

CASE 3.—M. C., a girl aged 15, was brought to the clinic because she had suddenly lost her voice several months before and had since been unable to speak above a whisper. Laryngeal findings were essentially negative, as is usual in these cases. However, a careful anamnesis revealed that the patient had a Latin teacher whom she disliked and who created strong tension feelings every time the patient recited. The fact that the patient was not a particularly good Latin scholar added to her dislike of the class. By losing her voice, she escaped from the necessity of reciting and inviting her teacher's criticism.

The patient's voice was readily restored, and a brief period of psychotherapy was introduced to give her an insight into the reason for the aphonia and to change her outlook on the causative environmental factor. There has been no recurrence of the condition.

CONCLUSION

The point I should like to emphasize is that the conditions underlying all these vocal and speech disorders do not suddenly develop at adolescence. It is true that the stresses and strains of this period may precipitate the acute symptom—the vocal or speech disorder—but the condition giving rise to it has been present and has been developing long before the adolescent years.

The pediatrician with this in mind can often detect these "disorders in the making." The nervous, disorganized child may become the adolescent stutterer. The inhibited, fearful, seclusive child may become the psychophonasthenic person of tomorrow. The timid, sensitive or effeminate boy may develop into the typical falsetto voice patient. The "flighty," overemotional child who uses temper tantrums to achieve her objectives or to evade unpleasant realities may, later in life, unconsciously resort to hysterical aphonia to accomplish the same end. The physician who sees these children early in life and recognizes their atypical behavior problems as indicative of maladjustment can, by judicious guidance, often prevent many acute and even disabling conditions from developing later on. Prophylaxis is, after all, the highest function of medicine.

61 Irving Place.

ABSTRACT OF DISCUSSION

DR. GEORGE B. DORFF, Brooklyn: This paper of Dr. Greene's, who has been a pioneer in speech disorders, has opened up certain new angles. Primarily I am interested in the endocrine aspects of these boys, and I know the difficulties that adolescents and adults, particularly those who are eunuchoids or sexually underdeveloped, have when these voice changes do not occur. Only the other day at the meeting of the Association for the Study of Internal Secretions Dr. Pratt presented a case of a eunuchoid doctor, about 30 years of age, who had a high pitched voice and was quite embarrassed. Under treatment with androgen there were produced definite changes in his makeup and particularly in his voice. In these eunuchoid types, particularly in the adult, the disturbance of voice and the appearance—lack of beard and the like—are the characteristics which worry the persons involved. It is not so much sexual because they are not aware of what sex means, but changes in the voice and facial appearance are the important things. Thus we have

here, from the endocrine point of view, a means of modifying the voice at least, if not also the genitals, in these types of cases in adolescents and some of the adults. In the last few years we have been able to stimulate certain processes in general, not only from a sexual standpoint but from a physical, a growth standpoint, and I am not referring to the use of commercial anterior pituitary growth hormone. We are doing it by way of the genital apparatus. By stimulating the gonads and developing the patient we can accelerate linear growth and produce puberal changes, as I did in one of the twins presented.

ORAL MANIFESTATIONS OF OCCUPATIONAL ORIGIN

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AND
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Our purpose in this report is to present a summary and analysis of the available information on oral occupational disease. The increase in occupational hazards and exposures coincident with the speeding up of industrial activities in the present emergency presents a special challenge to the medical profession to maintain the health of the worker. It is the private physician who sees most of the industrial workers. He is therefore the first to recognize early symptoms and findings of occupational diseases, many of which are in the oral cavity.

Ramazzini [1] (1633-1714), "the father of industrial hygiene," was the first to advocate the inclusion of the patient's occupation in each medical history and to point out a number of oral symptoms. In 1690 he warned painters against wiping brushes on their lips, and yet only recently the lives of a number of workers were lost because, in disregard to this simple precaution, they used their lips to moisten and point the brushes in painting luminous watch dials.

There are a limited number of reports and reviews [2] on oral occupational diseases, the most complete of which is by Koelsch.[3] Many of the available references are statments of descriptive rather than analytic nature. Direct investigations of carefully controlled cases are not common. There are several excellent textbooks [4] on occupational disease which present occasional references to oral lesions.

In evaluating the data in the literature one must realize that in instances in which working conditions have been sufficiently improved the associated manifestations previously reported are now of only historical interest. However, the limited supply of stocks essential to the war effort has necessitated substitutions involving the use of discarded methods and materials. It is not unlikely that occupational diseases previously eliminated may now reappear. Furthermore, with each succeeding change in industry new oral manifestations may arise.

Relatively few oral manifestations are included in the compilation of occupational disease symptoms in the 1941 Standard Bodyparts Adjustment Guide [5] prepared for insurance companies. It is quite possible that oral manifestations did occur but were not recognized by the examiners. It appears that neither the physician nor the dentist is sufficiently aware of the possible oral manifestations or actively interested in their recognition except after definite complaints by the patients.

This report attempts to analyze the various aspects of oral occupational disease on the basis of the following considerations:

1. The structure affected (table 1).
2. The pathologic process (table 2).
3. The etiologic agent (table 3).
4. The occupational incidence (table 4).

PHYSIOLOGY OF THE ORAL CAVITY

The oral cavity is a port of entry for many diseases and presents several unique features which make it especially prone to occupational disease. It is more usually exposed to injurious agents than any other organ or region of the body. It is usually unprotected except when masks are worn. The function of the oral cavity as the port of entry of food and its participation in mastication, speech and laughter keep it open a considerable part of the time in spite of the readiness of the lips to close it.

Ingestion and inhalation of foreign substances that tend to stagnate and collect within the oral cavity lead to an accumulation of irritants of a chemical, physical or bacterial nature, especially along the gingival crevices about the teeth. The gingival portion of the oral mucosa, because of its frequent exposure to irritation, is in a constant subclinical state of disease and often shows microscopic and macroscopic responses of inflammation.

The oral cavity is a moist chamber which offers a warm, nutritive and protected environment for bacteria and infection. Nevertheless, wounds in the mouth are not commonly infected because of the rich blood and lymph supply and the bacteriostatic action of the saliva. Once this resistance is lowered, however, the vulnerability of the oral tissues comes into play. While the rich blood and lymph supply promotes ready and relatively rapid absorption, it also brings to the oral tissues whatever systemic influences may obtain elsewhere, whether they are physiologic or pathologic in their effect. Thus the soft tissues as well as bone are vulnerable to both local and systemic irritations. This is in contrast to the exposed enamel and the underlying dentin, which, because they are both avascular and acellular, are affected only by local factors.

From the Department of Histology, University of Illinois College of Dentistry.

Read before the fourth annual Congress on Industrial Health, Chicago, Jan. 14, 1942.

Drs. M. H. Kronenberg, chief of the Division of Industrial Hygiene, Illinois Department of Public Health, and C. M. Peterson, secretary of the Council on Industrial Health, American Medical Association, encouraged the authors in this study.

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The different types of structure ranging from the oral mucosa to the highly specialized and mineralized enamel account for the rich variety of response that is displayed in the oral cavity (fig. 1). It must be pointed out that the regenerative power of the gingivae is high and that the introduction of oral hygiene and the removal of irritations result in a ready return to health.

The oral structures may be divided into the hard and soft parts.

HARD STRUCTURES

While the enamel, dentin, cementum and bone are all hard, calcified structures, they differ significantly in their response to injury and their capacity to repair.

Enamel.—This structure is formed in a protected environment within the bony crypts of the jaw and during its period of formation and calcification responds

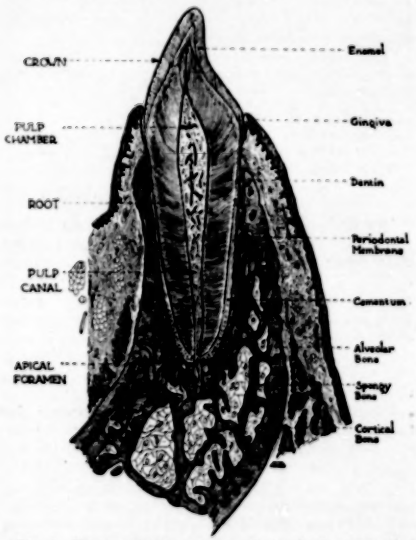

Fig. 1.—Diagrammatic representation of the dental tissues (from Noyes, Schour and Noyes; courtesy of Lea & Febiger).

very delicately to changes in general metabolism, particularly those in calcium metabolism. When, however, the enamel has been completed and has appeared in the oral cavity, it has lost its formative organ and therefore its power of growth. It can then be affected only by local environmental agents.

The enamel of the erupted tooth is exposed to the oral fluids and environment. Its response to injury is mechanical or chemical and entirely passive. Being without cells, blood or lymph supply, the enamel is incapable of inflammatory reaction. Mechanical trauma does not result in increased cornification as in the skin but in physical wear, the type of trauma determining the pattern of wear. The action of acid is very effective, since the mineral salts which constitute nearly 100 per cent of the enamel dissolve readily even in a mildly acidic medium.

The ready response of enamel to acids makes it vulnerable to decalcification. A smooth surface of enamel that is clean and bacteria free will not decay. However, the pits and fissures and the interproximal areas of the teeth are rarely free from débris and therefore are favorable regions for bacteria and acid fermentation and dental caries.

Dentin.—This structure is also noncellular and avascular but can transmit through its tubules stimuli from the enamel surface to the pulpal cells. The latter, in turn, respond by forming an atypical dentin (secondary dentin) which is often followed by sclerotic changes in the dentinal tubules and matrix.

Cementum.—The cementum covers the root of the tooth and is normally well protected by the investing structures. It does not respond to external local factors unless it has become exposed by the recession of the gingivae and pocket formation. Normal cementum, like bone, undergoes continuous formation throughout life, permitting continuous reattachment of newly formed periodontal fibers. Unlike bone, however, resorption of cementum is a pathologic condition. Unfavorable systemic conditions may destroy the vitality of the cementum and lead to detachment of the peridontal fibers by cementum resorption.

Alveolar Bone.—The alveolar bone, in contrast to the enamel and dentin, undergoes continuous apposition and resorption and consequently is susceptible of repair. It grows throughout life in adjustment to the continuous eruption of the teeth. The proximity of alveolar bone marrow to chronic gingival inflammation makes it more vulnerable to osteomyelitis. Involvement of the jaw bone is secondary to that of the alveolar bone and usually occurs much later.

SOFT STRUCTURES

The soft structures may be divided into those immediately associated with the teeth and those found in the remainder of the oral cavity.

The soft dental structures are the pulp within the tooth, the periodontal membrane surrounding the root and the gingivae, which cover the alveolar bone and invest the necks of the teeth.

The Gingivae.—This tissue constitutes that portion of the oral mucosa which rests on bone, chiefly alveolar bone, and has therefore been called alveolar mucosa. Its attachment to the underlying bone and its protection by a superficial cornified layer of epithelium give it a firm resistant texture. The sensory nerve supply of the gingivae is limited. Injuries to the gingivae are therefore relatively less painful and often are neglected.

The gingivae have rightly been called the gateway to oral health. They are more exposed to chronic irritation than any other portion of the oral cavity and are therefore in a state of chronic inflammation. This subclinical state of inflammation is associated with the presence of many plasma cells in the connective tissue and is so common that it may be regarded as characteristic of the gingivae.

The gingival crevice which arises during the separation between the gingival epithelium and the tooth coincident with the continuous eruption of the tooth is an especially vulnerable region. This favors the formation of a pocket with its sequelae of regressive injuries to the investing and supporting dental structures.

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The Oral Mucosa.—The soft oral structures that are not immediately associated with the teeth are the freely movable portion of the oral mucosa, the lips, the tongue and the salivary glands. The oral mucosa is not covered by a cornified epithelial layer and is quite sensitive.

The color of the oral mucosa is a transparent red, in contrast to the opaque pink coloration of the gingivae,

TABLE 1.—*Oral Manifestations of Occupational Disease According to the Structure Affected*

Mode of Action	Structure Affected		Etiologic Agent	Manifestation
Local	Tooth	Enamel and dentin	Dust	Staining
			Dust	Abrasion
			Prehension of instruments	Abrasion
			Acid	Decalcification
			Sugar	Caries
	Supporting structures	Gingivae	Dust, mercury compounds	Gingivitis
			Dust, heavy metals	Pigmentation
			Variations in atmospheric pressure, calculus, benzene	Hemorrhage
			Acid, mercurial compounds	Ulceration
		Periodontal membrane	Mercurial compounds	Periodontitis
			Dust, flour	Calculus
		Alveolar bone and jaws	As-Cr-Hg-P-Ra	Osteomyelitis and necrosis
			Fluorine	Sclerosis
+ Systemic	Oral cavity	Lips	Low humidity, dust	Dryness, fissure cheilitis, leukoplakia
			Aniline, carbon monoxide	Coloration of lips
			Tar	Carcinoma
		Oral mucosa	Dust	Pigmentation
			Chemicals	Stomatitis
		Tongue	Food tasters	Anesthesia, paresthesia
		Salivary glands	Mercury compounds	Ulceration, ptyalism
			X-ray, radium	Xerostomia
			Increased intraoral pressure	Pneumatocele

in which the rich capillaries are not so readily seen because of the presence of the opaque corneated layer of epithelium.

Injuries to the gingivae and oral mucosa heal more rapidly than do similar injuries elsewhere. The reason for the more rapid rate of healing may be found in the high vascularity of these tissues, their rich lymph supply and the bacteriostatic quality of the saliva.

PATHOLOGY

Basically, every oral manifestation of occupational disease is a reaction following the exposure of the oral cavity or its component parts to external noxious agents which act either locally or systemically (table 1).

The various pathologic end results may be classified (table 2) in the following order: (*a*) abrasion, (*b*) decalcification, (*c*) caries, (*d*) pigmentation of enamel and gingivae, (*e*) inflammation, (*f*) circulatory disturbances, (*g*) degeneration and (*h*) neoplasm.

ABRASION, DECALCIFICATION, CARIES

Because of our child labor laws, few engage in work while their teeth are still growing. Developmental defects such as enamel hypoplasia or mottled enamel, therefore, do not occur as a result of occupational hazards. However, breast feeding by mothers working with cryolite has resulted in the mottled enamel of their children.[6] The hardness and chemical composition of enamel and dentin predispose them to the pathologic processes of abrasion, decalcification and dental caries, which are uniquely characteristic of the teeth alone.

6. Roholm, Kaj: Fluorvergiftung bei Kryolitharbeitern, Arch. f. Gewerbepath. u. Gewerbehyg. **7**: 254-277, 1937.

Abrasion.—Abrasion or excessive wearing of enamel and dentin is dependent on some abrasive acting for a relatively long period. Localized abrasion is found in occupations in which the teeth are used for the holding of various objects. Thus seamstresses will show fine notches on the incisal edge of their anterior teeth as a result of biting thread or holding the needle between the teeth (fig. 2*A*). Larger areas of wear are seen in the teeth of carpenters, shoemakers and upholsterers, who hold tacks or nails in the mouth (fig. 2*B*). This is not surprising when one considers the fact that a worker in the automobile upholstery business can place 8,000 tacks a day.[7] In glass blowers, players of wind instruments and policemen a definite pattern of wear on the teeth will result, depending on where the pipe, instrument or whistle is placed (fig. 2*C*).[8] These stigmas are permanent because the enamel and dentin are not susceptible of repair, as are bone and soft tissue. The holding of foreign bodies in the mouth may also lead to fractures of the enamel and traumatic effects on the periodontal structures.

TABLE 2.—*Oral Manifestations of Occupational Disease According to the Pathologic Process*

Pathologic Process	Structure Affected	Etiologic Agent	Diagnosis
Excessive wear	Enamel and dentin	Instruments of prehension: nails, thread, whistle	Localized abrasion
		Cement, sand	Generalized abrasion
Chemical reaction	Enamel and dentin	Acids	Decalcification
Bacterial action, fermentation	Enamel and dentin	Sugar	Caries
Pigmentation (Direct contact (physical))	Enamel	Metals	Stained enamel
	Oral mucosa	Carbon metals	Pigmentation of oral mucosa
Pigmentation (Via blood stream (chemical))	Gingivae	Lead, mercury, bismuth	Heavy metal sulfide line of gingivae
	Lips, oral mucosa	Carbon monoxide	Cherry red lips (carbon monoxide and hemoglobin)
Inflammation	Lips	Low humidity, heat, cold, trauma, acid, metals	Cheilitis
	Oral mucosa, gingivae	Heat, cold trauma, mercury, alkali, acid	Stomatitis, gingivitis
	Periodontal membrane	Mercury, flour	Periodontitis
	Alveolar bone, jaws	Arsenic, mercury, phosphorus, radium	Osteomyelitis
Circulation	Gingivae and mucous membrane	Benzene, variations in atmospheric pressure	Hemorrhage
Degeneration	Oral mucosa and lips	Mercury, acid	Ulceration
	Alveolar bone and jaws	Radium, x-ray	Osteonecrosis
	Salivary glands	Radium, x-ray	Necrosis (xerostomia)
Neoplasm	Oral mucosa	Hot coffee, tea, irritation	Leukoplakia
	Lips	Electricity, outdoor exposure, tar	Leukoplakia, carcinoma of lip

Dust of abrasive quality, such as cement or sand, will collect on the occlusal surfaces of the teeth and produce generalized abrasion. Abrasive powders and pastes used to clean the teeth can also cause abnormal wear.

7. In a recent decision of the Wisconsin State Industrial Commission the employer was ordered to pay an upholsterer the cost of restorations necessary to correct the dental disability resulting from holding tacks between the teeth.

8. Kraus, M.: Ueber Veränderungen an den Zähnen als besondere Folgen beruflicher und gewerblicher Beschäftigung, Zentralbl. f. Gewerbehyg. **3**: 127-129 (May) 1926. Herrmann, W.: Ueber die im Glasbläserberufe vorkommenden Schädigungen und Erkrankungen des Mundes und der Zähne, sowie deren Prophylaxe und Therapie, ibid. **7**: 193-197 (July); 218-223 (Aug.) 1930.

A distinction, however, should be made between abrasion and attrition. The latter is the physiologic wear of teeth with age.

Decalcification.—Decalcification of enamel and dentin, a local chemical action, is seen following exposure to acids among workers in explosive factories or acid dippers[9] (fig. 3). The acid fumes deposited on the exposed portions of the teeth react with the enamel, which is completely calcified, and decalcification results. The earliest reaction consists of a superficial decalcification of the enamel of the labial surface of the tooth which is exposed most. Mastication and tooth brushing wear off the partially decalcified areas and produce flat smooth surfaces. The normal luster is lost. Since it is less exposed to the acid fumes and is protected by more saliva, the lingual surface is preserved longer, and the crown takes a sloping form. The crowns of the teeth disintegrate with prolonged exposures.

Similar action on the teeth is seen in medical practice in patients with protracted vomiting in which the hydrochloric acid from the stomach decalcifies the enamel. In these cases, however, the lingual surfaces of the teeth are affected first. Patients receiving hydrochloric acid for achlorhydria should therefore be cautioned to use a glass drinking tube to avoid the decalcification of the enamel.

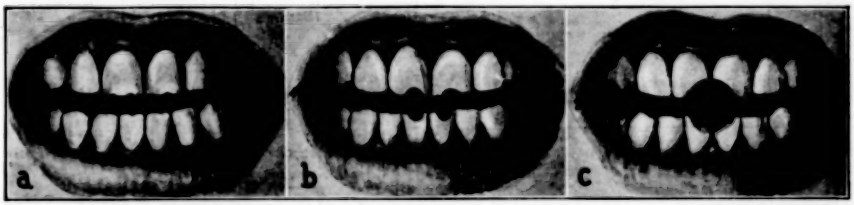

Fig. 2.—Abnormal local wear of teeth (abrasion) due to repeated (a) biting of thread (seamstress), (b) holding nails between teeth (carpenter) and (c) holding pipe between teeth (glass blower).

It must be pointed out that it is only by this local means that calcium can be removed from the tooth. The enamel and dentin cannot serve as a storehouse for calcium, since they are acellular and avascular, and calcium withdrawal does not occur even during severe upsets in calcium metabolism (hyperparathyroidism) or in pregnancy, as is commonly believed. In the bones, however, resorption may take place, and in that manner the need for calcium may be supplied.

Dental Caries.—Dental caries is the third local process that is uniquely characteristic of the teeth. A high incidence of tooth decay has been reported among workers who are exposed to sugar dust.[10] The latter tends to be deposited along the labial gingival surfaces of the crown where it stagnates and induces abnormal fermentation and, with the aid of bacteria, acid production. The resulting caries first assumes the form of a demilune and spreads over the surface of the crown in a characteristic manner (fig. 4). Röse[11] examined the caries incidence in different occupations and found the highest incidence among sugar bakers. A carefully controlled study of the problem of so-called "sugar caries" is very much needed. Abrasion, decalcification and caries are irreversible destructive processes on the teeth, which are not subject to self repair. Consequently, all efforts should be made to prevent their occurrence.

PIGMENTATION OF ENAMEL

Characteristic staining of enamel is observed among workers exposed to metal dusts which lodge on the teeth.[12] Thus copper workers show a green and silver workers a black staining of deposits at the necks of the teeth (fig. 5). Staining may also be seen on the teeth of patients who are receiving iron compounds and are not using a glass drinking tube to prevent contact. In contrast, the green stain which frequently is seen associated with gingival mucous plaques in children is due to chromogenic bacteria. These stains may be removed by proper cleansing of the teeth.

PIGMENTATION OF GINGIVAE

The exogenous pigmentations of occupational origin that become effective after absorption and circulation in the blood stream should be distinguished from the endogenous brown melanin of the gingivae that is seen normally, especially in the Negro.

The location of the pigment varies with its nature and method of absorption or deposition. Melanin is found in the basal layer of the epithelium. The coal or metal dusts accumulate on the surface of the gingivae or penetrate various levels of the epithelium and sometimes even the dermis. The sulfides of heavy metals, on the other hand, are found only in the dermis but become, nevertheless, clinically visible as lines about the gingivae (fig. 6). Pigmentation in other parts of the oral cavity is not common.

Gingival Lead Line.—Pigmentation of the gingivae is often but not always observed following the ingestion or inhalation of the heavy metals—lead, bismuth or mercury. This was first described by Grisolle[13] in 1835. In addition, a similar black discoloration in the mucosa of the colon and lower portion of the small intestine was first observed by Tanquerel[14] in 1839. Lead alone is known to be a potential hazard in about one hundred and fifty specific occupations (table 4).

The pigmentation when present tends to be sharply localized about the gingival margin and gives rise to the so-called heavy metal line. The mere ingestion or inha-

9. Simpson, R. S.: Action of the Acids on the Teeth of Workers in High Explosive Factories, Dominion Dent. J. **31**: 94-97 (Feb. 15) 1919. Muzu, Edmondo: Il significato delle lesioni dentali per azione degli acidi, Stomatologia **25**: 107-118, 1927.

10. Hesse, F.: Zahnkaries bei Bäckern, Deutsche Monatschr. f. Zahnh. **4**: 238-239, 1886. Kunert: Die Zahnkaries bei Bäckern und Konditoren, ibid. **19**: 351-375, 1901. Munsmacher, E.: Die Kariesfrequenz bei den Würzburger Bäckern und Zuckerarbeitern, Inaug. Dissert., Würzburg, 1937. Lyons, D. C.: Caries and Gingival Lesions Due to Certain Industrial Hazards, Dent. Items Interest 953-954 (Oct.) 1941.

11. Röse, C., cited by Blessing: Gewerbliche Intoxikationen und ihre Symptomen in der Mundhöhle, Ergebn. d. ges. Zahnh. **5**: 95-119, 1917.

12. Petri, E.: Vergiftungen, in Henke, Friedrich, and Lubarsch, Otto: Handbuch der speziellen pathologischen Anatomie und Histologie, Berlin, Julius Springer, 1930, Kraus.[8]

13. Grisolle, A., cited by Auh, Fairhall, Minot and Reznikoff.[10]

14. Tanquerel des Planches, L.: Traité des maladies de plomb, ou saturnines, Paris, Ferra, 1839; cited by McNally.[10]

lation of lead is not sufficient to produce a lead line. Another essential factor is the presence of poor oral hygiene as manifested by the presence of calculus or débris and of chronic gingivitis. Lead absorption does not cause inflammation but rather inflammation brings

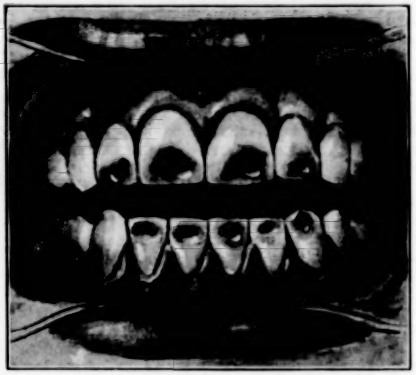

Fig. 3.—Decalcification of enamel by acid fumes. The labio-incisal portions of the teeth, which are most exposed, are affected first.

out the lead line, which thus acts as an indicator of the presence of gingivitis. It follows, therefore, that in the clean, healthy mouth a lead line will not occur in spite of lead intoxication.

Clinical Appearance: Goadby [15] has distinguished several degrees of lead lines:

1. Faint, mottled patches of bluish black at the extreme edge of the gum, often affecting only single teeth and best seen with a hand lens.

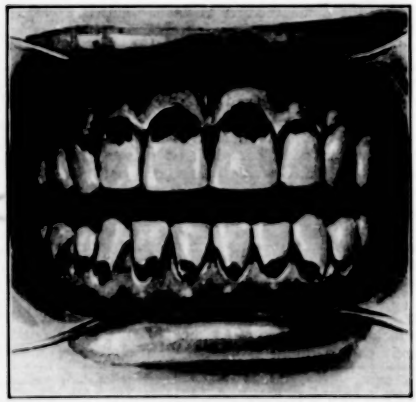

Fig. 4.—Sugar caries as seen in pastry bakers and candy makers (after Krause). The labiogingival areas of the teeth are attacked first.

2. A blue-black line, finely penciled, following the whole of the gum margins, increasing in depth to positions where inflammation of the gums is more pronounced.

3. A blue-black line at the margin of the gums which fades imperceptibly into the rest of the gingival tissue, the upper or free margin of the gum being the most intensely stained. Patches of black or blue-black pigment are also found on the cheeks, usually opposed to large patches of tartar.

Mechanism of Action and Histologic Analysis: Following its inhalation or ingestion, the lead reaches the blood stream, where it is present in colloidal solution as tertiary phosphate. The lead is then stored in different parts of the body, especially in bone. Histologic studies show that black lead sulfide granules are absent in epithelium but are found in the histiocytes of the connective tissue.[16] Hydrogen sulfide formed during the protein decomposition in food débris and coincident with the cellular destruction and increased metabolic activity in gingivitis penetrates the epithelium and unites chemically with the heavy metal in the connective tissue adjacent to the blood vessels to form a black precipitate of lead sulfide. Accumulations of the granular lead sulfide give the characteristic clinical lead sulfide line.

Siegmund and Weber [17] found the earliest effect in the adventitial cells near the blood vessels of the con-

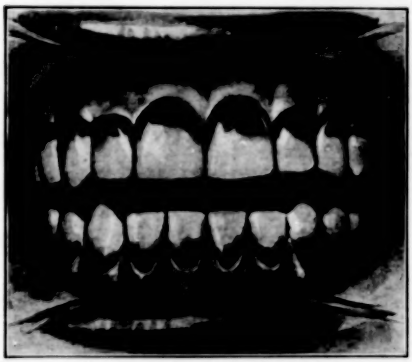

Fig. 5.—The superficial staining of the crowns of teeth in workers who practice poor oral hygiene and are in contact with metallic dusts. The coloration varies with the particular metal (after Krause).

nective tissue papillae. These cells, following the laws of vital staining, store the lead which was in solution in the circulating blood in very fine granules. The latter are gathered into larger particles, resulting in the enlargement of the histiocytes, which are also found in the loose connective tissue. In later stages, the lead granules are seen in fibroblasts and in the intercellular substances. Finally the fibrils are densely impregnated with the black lead sulfide granules, and their deposition occurs also in the basement membrane.

All material that was available for their study showed gingivitis, as evidenced by cellular proliferation and exudate and a considerable thickening of the epithelium. Thus gingivitis was the condition that made possible the reception and deposition of the lead, and these investi-

15. Goadby, Kenneth: Diseases of the Gums and Oral Mucous Membrane, London, Frowde, Holder & Stoughton, 1923.

16. Aub, J. C.; Fairhall, L. T.; Minot, A. S., and Reznikoff, Paul: Lead Poisoning, Baltimore, Williams & Wilkins Company, 1925, pp. 1-250. Minker, M. A.: Der Bleisaum, Deutsche Monatschr. f. Zahnh. **40**: 401-412 (April 15) 1928.

17. Siegmund, H., and Weber, R.: Pathologische Histologie der Mundhöhle, Leipzig, S. Hirzel 1926.

gators therefore regarded lead pigmentation as a special case of vital staining in the region of inflammation. Capillarimicroscopic studies of heavy metal lines have confirmed the microscopic results.[18]

The Importance of Oral Hygiene in the Production of the Lead Line: Goadby [15] in a careful study of lead poisoning was unable to recognize a lead line in persons with clean mouths free from gingival inflammation. Further evidence of the role of gingivitis in the production of the lead line is seen in the fact that lead lines are not found in infants or edentulous patients. The relationship between lead exposure, oral hygiene and the formation of the lead sulfide line may be represented in the following formulation:

$$\text{Lead exposure} \times \text{Hydrogen sulfide elaborated in inflamed gingival areas} = \text{Sulfide lead line}$$

Thus the lead exposure alone is not sufficient to produce a lead line. The presence or absence of the latter is therefore not an accurate index of lead poisoning unless one takes into consideration the state of oral health.

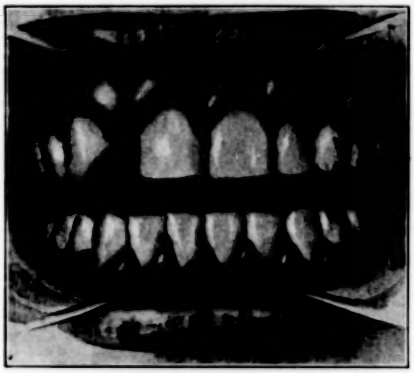

Fig. 6.—The heavy metal (sulfide) line in the gingivae.

Differential Diagnosis: The lead line was selected as representative of the "heavy metal" lines seen in the gingivae. The mercury and bismuth lines arise in a similar manner. It is difficult to differentiate them. They should not be confused with the cyanotic bluish tinge seen in the gingival margin in suppurative gingivitis or periodontitis or with the surface stains of the enamel adjacent to the gingivae.

INFLAMMATION

Enamel, Dentin and Pulp.—Enamel is nonvital. It is avascular and acellular. Consequently trauma and irritation do not elicit an inflammatory reaction, which would be expected in living tissues. The same is true of dentin. When injury of the enamel and dentin has been sufficiently severe to irritate the pulp, the latter will respond by formation of secondary dentin, hyperemia or inflammation. In the event of inflammation, death of the pulp usually follows. The reason for this is that the pulp is surrounded by the calcified, non-yielding walls of dentin and the narrow apical foramen acts as a bottleneck, limiting the arterial blood supply but retarding the venous return and causing self strangulation.

Gingivae.—A mild subclinical gingivitis is present in most persons. This condition may, however, be aggravated by various occupational agents that act in the oral cavity. It is likely that many stubborn cases of gingivitis which do not respond to the accepted treatment may be due to some persistent occupational factor.

Lips and Oral Mucosa.—Cheilitis may result from exposure to dust, low humidity and chemical agents. A reaction has been reported following exposure to volatile oils.[19] Lipstick dermatitis is usually caused by the action of the perfume.[20]

The various acids (hydrochloric, hydrofluoric, sulfuric and nitric) affect the oral cavity by direct contact with the spray or fumes. Ulceration and inflammation of the soft tissues of the mouth with some hemorrhage and decalcification of exposed calcified structures are the common manifestations. Gases like ammonia, chlorine and bromine have a local irritating action, ammonia vapor leading to reddening and bleeding of oral mucosa.

The traumatized tissue may become secondarily infected because the oral cavity is an excellent incubator for bacteria. Bacteria today are seldom the primary etiologic agents of lesions of the mouth. Glanders and hoof-and-mouth disease are rarely seen but should be remembered in the differential diagnosis. Actinomycosis, according to recent evidence, is endogenous in the oral cavity and occurs without contamination from the outside.[21] The specific bacterial etiology of "Vincent's infection" is increasingly being challenged. The fusiform and spirochetal organisms are probably only secondary invaders and are not direct and important factors.[22]

Bone.—The alveolar processes and jaws are frequently the first structures affected. This is exemplified particularly in yellow phosphorus poisoning in which the "phossy jaw" is a characteristic finding,[23] in mercurial poisoning in which the teeth become loose and are eventually exfoliated, and in radium poisoning, which was first diagnosed because of toxic effects on the jaw bones.

Alveolar bone in the adult has a lower threshold to infection than other bone because of the surrounding infection associated with gingivitis, the continued stress and strain of mastication and its more active growth and metabolism. In addition, alveolar bone may be exposed to phosphorus, mercury or radium compounds through three routes—ingestion, blood stream and salivary gland secretion (fig. 10)—whereas other bones are exposed only through the blood stream.

In the early stages only the alveolar bone is affected. In mercury poisoning the disease process may be limited to the alveolar portion of the mandible and maxilla and rarely extends much beyond the level of the apexes of

18. Krey, Heinrich: Ueber die Kapillaren der Mundschleimhaut unter dem Einfluss von Salvarsan und Schwermetallverbinungen, Paradentium, Ztschr. f. d. Grenzfragen d. Med. u. Odontol. **9:** 81-94 and 117-126, 1936.

19. Miller, Jerome: Cheilitis from Sensitivity to Oil of Cinnamon Present in Bubble Gum, J. A. M. A. **116:** 131-132 (Jan. 11) 1941.

20. Baer, H. L.: Lipstick Dermatitis, Arch. Dermat. & Syph. **39:** 726-734 (Nov.) 1935.

21. Davis, M. I. J.: Analysis of Forty-Six Cases of Actinomycosis with Special Reference to Its Etiology, Am. J. Surg. **52:** 447-454 (June) 1941. Slack, John: The Source of Infection in Actinomycosis, J. Bact. **43:** 193-209 (Feb.) 1942.

22. Black, W. C.: The Etiology of Acute Infectious Gingivostomatitis (Vincent's Stomatitis), J. Pediat. **20:** 145-160 (Feb.) 1942. Rosebury, Theodor: Is Vincent's Infection a Communicable Disease? J. Am. Dent. A. **29:** 823-834 (May) 1942.

23. Ward, E. F.: Phosphorus Necrosis in the Manufacture of Fireworks, J. Indust. Hyg. **10:** 314-330 (Nov.) 1928.

the teeth.[24] In the later stages, however, the osteomyelitis may include a greater portion of the jaws and is followed by sequestration. Consequently workers exposed to mercury, phosphorus or radium compounds, or patients receiving mercury, bismuth or radiation therapy in the maxillofacial region, should maintain the oral cavity in the optimum state of health. The soft tissues and teeth should be kept clean so that the noxious agents will not accumulate and be absorbed and so that the gingivae will remain as free of infection as possible. Carious and pulpless teeth that are beyond treatment should be extracted before the individual is exposed. Observance of oral hygiene will prove to be a valuable safeguard because surgical treatment of the jaws is hazardous in such cases.

TABLE 3.—*Oral Manifestations of Occupational Disease According to the Etiologic Agent*

Etiologic Agent: Physical State	Etiologic Agent: Principal Action	Etiologic Agent: Specific Factor	Occupation	Possible Oral Manifestations
Solid	Physical	Instruments for prehension	Cobblers, carpenters, glass blowers, musicians (wind instruments), seamstresses	Localized abrasion
	Chemical	Tar	Fishermen, asphalt and coal tar workers, pavers, pitch roofers, wood preservers	Stomatitis, carcinoma of lip and mucosa
Dust	Physical	Inorganic Copper, iron, nickel, chromium, coal, etc.	Bronzers, cement workers, electrotypers, grinders (metal), miners, stone cutters	Staining of teeth, pigmentation of gingivae, generalized abrasion, calculus, gingivostomatitis, hemorrhage
		Organic Bone, celluloid, sawdust, flour, tobacco	Bone, celluloid, flour, sawmill, textile and tobacco workers	Staining of teeth, pigmentation of gingivae, generalized abrasion, calculus, gingivostomatitis, hemorrhage
	Chemical	Inorganic Arsenic	Chemical workers, electroplaters, metal refiners, rubber mixers, lead smelters, insecticide makers	Necrosis of bone
		Bismuth	Bismuth handlers, dusting powder makers	Blue pigmentation of gingivae, oral mucosa, gingivostomatitis
		Chromium	Aniline compound, chrome, photographic and steel workers, blue printers and rubber mixers	Necrosis of bone, ulceration of oral tissues
		Fluorine	Cryolite workers	Osteosclerosis
		Lead	Electrotypers, insecticide and storage battery makers, lead refiners, printers, rubber compounders	Blue-black pigmentation of gingivae, gingivostomatitis
		Mercury	Bronzers (gun barrels), battery and paint makers, dentists, detonators, explosive and mercury salts workers	Gingivostomatitis, osteomyelitis, ptyalism
		Phosphorus (white, yellow)	Brass founders, match factory, phosphor bronze workers, fertilizer and fireworks makers	Gingivostomatitis, ulceration of oral tissues, osteomyelitis
		Organic Sugar	Refiners, bakers, candy makers	Caries
Liquid	Physical	Hot food (coffee, tea, soup)	Tasters	Stomatitis, leukoplakia
	Chemical	Aniline	Aniline, coal tar, explosive workers, painters, tannery workers, vulcanizers	Blue coloration of lips and gingivae
		Benzene	Coke oven and lacquer workers, dry cleaners, vulcanizers, smokeless powder makers	Hemorrhage from gingivae, stomatitis, blue coloration of lips
		Cresol	Coal tar, rubber, tar, distillery and surgical dressing workers, disinfectant makers	Stomatitis
		Wine and liquor	Tasters	Anesthesia and paresthesia of tongue
Gas	Physical	Atmosphere Increased pressure	Divers, caisson workers	Bleeding from gingivae
		Decreased pressure	Aviators	Bleeding from gingivae
	Chemical	Acids: H_2SO_4, HNO_3, HCl, HF	Acid and cartridge dippers, petroleum refiners, explosive and gun cotton workers, galvanizers	Bleeding, stomatitis, decalcification of enamel and dentin
		Amyl acetate	Alcohol, distillery, explosive, shellac, smokeless powder and shoe factory workers	Stomatitis
		Acrolein	Bone grinders, lard, soap, linoleum makers, varnish boilers	Stomatitis
		SO_2, NH_3, BR, Cl_2	Acetylene, dye, photographic film, phosgene makers, sugar refiners, refrigerating plant, disinfectant, laundry workers	Stomatitis
		CO, CO_2	Miners, smelters, gasoline motor workers	Coloration of lips (cherry red, blue)
Ray	Physicochemical	Radium, x-ray	Technicians, watch dial painters, research men	Gingivitis, periodontitis, osteomyelitis and necrosis, xerostomia, osteosclerosis
		Actinic	Sailors, fishermen	Carcinoma of lip

MERCURY POISONING

Mercury poisoning may be manifested in all the soft tissues of the oral cavity as well as in bone (fig. 7). The usual accompanying symptom is an exacerbation of preexisting oral disease. The stomatitis arises in areas of gingivitis and periodontitis. According to Siegmund and Weber,[17] mercurial necrotic stomatitis begins with the deposition of metallic mercury in the capillary endothelium and adventitial cells leading to circulatory disturbances, stasis and diapedesis. This is followed by tissue necrosis, bacterial invasion from the area of gingivitis and finally destruction of the tissue. Gross examination reveals inflammation of the mucous membrane. The gingivae are tender, soft, swollen and receded. Mercury sulfide, as in lead and bismuth poisoning, is deposited in the subepithelial tissue and is manifested as a blue-black line on the gingivae around the teeth.[25] The teeth are loose and the swollen tongue shows the impressions of the teeth. Mechanical injuries of mastication, friction of the tongue on the teeth and irritation are factors in ulceration. The excess salivation is believed to be due to a stimulation of the secretory nerves by mercury.[26] Many of these symptoms were described by Ramazzini[1] in 1713 in mercury miners in Spain.

24. Major, Glenn, and Bonsni, Sidney: Osteomyelitis of the Jaws Following Acute Mercury Poisoning, Am. J. Orthodontics **25**: 82-88 (Jan.) 1939.

25. Almkvist, J.: Mercury and Bacteria in Mercurial Stomatitis, Acta dermat.-venereol. **1**: 312-364, 1920.

26. Besseson, D. H. L.: The Pathogenesis of Mercurial Stomatitis, Arch. Dermat. & Syph. **7**: 332-362 (March) 1923.

Mercury compounds are potential hazards in more than one hundred occupations today (table 4). While the occurrence of mercury poisoning in hatters and fur-cutters was reported as early as 1859,[27] the mercury hazard among these workers has been eliminated only recently.[28]

TABLE 4.—*Oral Manifestations of Occupational Disease According to the Occupation*

Occupation	Active Agent	Possible Oral Manifestation
Abrasive powder workers	Dust	Generalized abrasion of teeth, calculus
Acid dippers	Fume	Decalcification of teeth, stomatitis
Arsenic roasters and handlers	Arsenic	Osteomyelitis and necrosis of mandible
Aviators	Variation in atmospheric pressure	Hemorrhage from gingivae
Bakery workers	Flour, sugar	Calculus periodontitis, caries
Candy workers	Sugar	Caries
Carpenters	Nails	Localized abrasion of teeth
Coal tar contacts	Tar	Carcinoma
Cryolite workers	Fluorine	Osteosclerosis
Electrotypers	Lead	Lead line, gingivae
Explosives workers	Benzene	Hemorrhage from gingivae
Garment workers	Chemicals, dyes, foreign bodies in mouth	Stomatitis, abrasion of teeth
Glass workers	Hydrofluoric acid, increased intraoral pressure	Decalcification, pneumatocele, abrasion
Lead workers	Lead	Lead line, gingivae
Metal workers	Dust (iron, copper, chromium)	Staining of enamel, pigmentation of oral mucosa
Mercury workers	Mercurial compounds	Gingivitis, periodontitis, ulcerations, ptyalism, osteomyelitis
Photographic workers	Mercurial compounds, chromium	Gingivitis
Polishers and blasters	Dust	Abrasion, pigmentation
Stoneworkers	Dust	Abrasion, gingivitis
X-ray technicians	X-ray (radium)	Xerostomia

In a recent examination of fur-cutters for mercury poisoning, significant findings were observed in the supporting structures of the teeth.[29] However, the incidence of caries was about equal in the two groups. The enamel and dentin, which are nonvital, were naturally not affected by the mercury compounds.

Workers using an antifouling mercurial paint to protect hulls of warships from growth of aquatic life have shown mercurial poisoning. The most common disorders were tremor of the hands and gingivitis. The chief complaints were hoarseness and fatigue, sore gums and bad taste.[30]

CIRCULATORY DISTURBANCES

Bleeding gingivae may act as an indicator of local or systemic disease. Local causes are usually deposition of calculus and gingivitis. Variations in atmospheric pressure to which divers, caisson workers and aviators are subjected may cause hemorrhage, especially if gingival irritation is already present.

Gingival bleeding, ulceration and necrosis of the maxilla may result from exposure to benzene,[31] as among vulcanizers, coke oven and smokeless powder workers (fig. 8). Benzene has a slow and insidious action. It has a direct effect on the bone marrow, causing an aplastic anemia. Bleeding from the gingivae, of course, is frequently seen in blood dyscrasias and vitamin C deficiency.

Carbon monoxide, the most common poisonous gas in industry today, unites with hemoglobin and gives a cherry red color to the blood.[32] Wherever the blood is close to the surface, as in the lips, the characteristic coloration is seen. In aniline poisoning the lips are blue.

DEGENERATION

The exposure of workers to radium has resulted in the destruction of the osteogenic properties of bone and in necrosis of the mandible. Xerostomia has occurred also following changes in the secretory epithelium of the salivary glands.

Ingestion of radium compounds by watch dial painters who point the brush with the lips was common several years ago.[33] Those working with radium and x-rays for technical and research purposes are also exposed to the radiations. The symptoms appear after a variable latent period. The gingivae become inflamed, ulcerated and painful and a foul breath is present. This may be followed by gingival recession, periodontitis and loss of alveolar bone. The teeth become loose and show resorption of the root. In the later stages, osteomyelitis, osteonecrosis and osteosclerosis of the jaws occur with the loss of teeth and the formation of sequestrums (fig. 9). In radium poisoning the symptoms usually occur early in the oral cavity.[34] The first case was diagnosed in 1924 because of oral complaints.[35]

It is therefore important that adequate precautions be taken by those working with radium and x-rays for technical and research purposes so that they will not be exposed to the radiations.

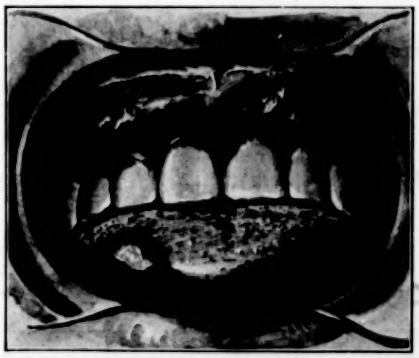

Fig. 7.—Mercurial stomatitis (after Koelsch). Note the gingival swelling and the ulcerations.

NEOPLASM

The reported incidence of carcinoma in the oral cavity is relatively high. The oral cavity is subjected to more irritation than many other parts of the body. In addi-

27. Johnstone, R. T.: Occupational Diseases: Diagnosis, Medicolegal Aspects and Treatment, Philadelphia, W. B. Saunders Company, 1941.
28. Mercurialism in the Felt Hat Industry, Current Comment, J. A. M. A. **118**: 54 (Jan. 3) 1942.
29. Neal, P. A., and Jones, R. R.: Chronic Mercurialism in Hatter's Fur-Cutting Industry, J. A. M. A. **110**: 337-343 (Jan. 29) 1938.
30. Goldwater, L. J., and Clark, P. J.: Mercury Poisoning from the Use of Anti-Fouling Plastic Paint, J. Indust. Hyg. & Toxicol. **24**: 21-23 (Feb.) 1942.
31. Hamilton, Alice: Benzene (Benzol) Poisoning, Arch. Path. **11**: 434-454 (March), 601-637 (April) 1931. Marchal, Georges; Maurel, Gérard, and Porge, Jean: Syndrome agranulocytaire accompagné de nécrose du maxillaire supérieur, par intoxication benzédique professionnelle, Sang **11**: 430-436, 1937.
32. McNally, W. D.: Toxicology, Chicago, Industrial Medicine, 1937.
33. Schwartz, Louis; Makepeace, F. C., and Dean, H. T.: Health Aspects of Radium Dial Painting: IV. Medical and Dental Phases, J. Indust. Hyg. **15**: 447-455 (Nov.) 1933.
34. Castle, W. B.; Drinker, Katherine R., and Drinker, C. K.: Necrosis of the Jaw in Workers Employed in Applying a Luminous Paint Containing Radium, J. Indust. Hyg. **7**: 371-382 (Aug.) 1925.
35. Blum, Theodor: Osteomyelitis of the Mandible and Maxilla, J. Am. Dent. A. **11**: 802-805 (Sept.) 1924.

tion, its ready accessibility permits earlier and more frequent diagnosis.

Outdoor workers, particularly sailors, exposed to the actinic rays, may develop carcinoma of the lip. This occurrence is further enhanced in sailors and fishermen by using tar. The latter frequently hold a tarred needle

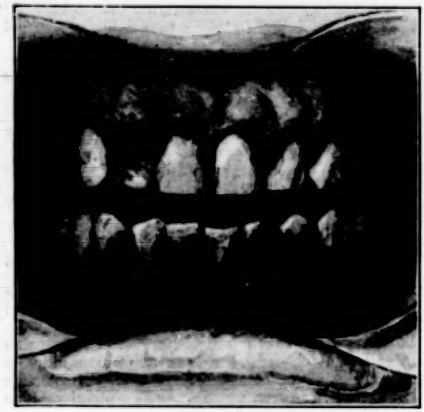

Fig. 8.—Gingival hemorrhage in benzene intoxication.

between the lips when repairing fish nets.[36] It has been reported that the incidence of carcinoma of the skin and lip of sailors in the United States Navy is eight times as high as the normal incidence.[37] Carcinoma of the lip and cheek is found also in pitch workers.[38] Carcinoma occurs in the lower lip of white males but seldom in the upper lip, and it is found less often in females and in Negroes.[39]

Carcinoma of the oral cavity is frequently preceded by leukoplakia. This is found particularly in cases in which chronic and recurrent irritation plays a role, such as in food-tasters (heat), glass-blowers (heat and trauma) and cobblers, whose oral structures are constantly irritated by nails held in the mouth.[40]

ETIOLOGY

An analysis of the various etiologic agents which are responsible for oral occupational disease shows that their harmful effects depend on their specific chemical, physical or bacterial nature (table 3), their physical state and their mode of entry (fig. 10).

THE SPECIFIC NATURE OF THE ETIOLOGIC AGENT

Chemical Agents.—Inorganic Group: The chemical agents, inorganic and organic, are the principal causes of occupational disease. The metals and their compounds comprise the inorganic group. Until recently metal poisoning was considered as confined to lead, mercury and arsenic. But with the development of specific alloys the toxic properties of all metals have demanded inquiry. Frequently a new substance has been used without prior knowledge of its effects on the body. While certain pure metals may be harmless, their compounds or acid salts may be poisonous. Thus the hazard offered by industry is seldom that of a single metal but rather of a combination of metals.[27]

Organic Group: The field of synthetic organic chemistry has expanded so rapidly in recent years that it is important to keep informed as to the effects of the new products used in industry not only in the oral cavity but in the entire body.[41]

Physical Agents.—While the chemical agents cause the majority of oral occupational diseases, physical agents are also of importance. They act locally on both hard and soft tissues. Dust, thread, nails or other solid objects kept between the teeth may produce abrasion of enamel and dentin. There are only a few studies on the influence of atmospheric temperature and humidity on the dryness of the oral mucosa.[42] Variations in atmospheric pressure to which aviators and divers are subjected may produce bleeding, especially if gingivitis is already present. Because of increased intraoral pressure (musicians of wind instruments and glass-blowers), air will sometimes enter Stenson's duct and the various lobes of the parotid gland and cause a chronic swelling [43] (pneumatoceles). The tasting of hot foods may irritate

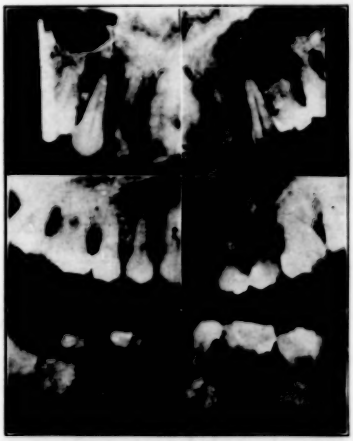

Fig. 9.—Intraoral roentgen appearance of teeth and alveolar bone showing pathologic resorption of the teeth and osteosclerosis and osteoporosis following radium poisoning in a watch dial painter (courtesy of Dr. W. W. Dalitsch, University of Illinois).

the oral tissues and result in leukoplakia. The possible effects of radiation from radium and x-rays and of the actinic rays have already been described.

36. Shambaugh, Philip: Tar Cancer of Lip in Fishermen, J. A. M. A. **104**: 2326-2329 (June 29) 1935.
37. Peller, S., and Stephenson, C. S.: Skin Irritation and Cancer in the U. S Navy, Am. J. M. Sc. **194**: 326-333 (Sept.) 1937.
38. Kennaway, E. L.: The Anatomic Distribution of the Occupational Cancers, J. Indust. Hyg. **7**: 69-93 (Feb.) 1925.
39. Heller, L.: Occupational Cancers, J. Indust. Hyg. **12**: 169-197 (May) 1930.
40. O'Donovan, W. J.: Discussion on Occupational Dermatitis, Brit. M. J. **2**: 499-504 (Sept. 16) 1922.
41. von Oettingen, W. F.: Organic Chemical Industrial Hazards to Health, Physiol. Rev. **22**: 170-189 (April) 1942.
42. Winslow, C. E. A.; Herrington, L. P., and Nelbach, Jean H.: The Influence of Atmospheric Temperature and Humidity on the Dryness of the Oral Mucosa, Am. J. Hyg. **33**: 27-39 (Jan.) 1941.
43. Naroth, A.: Ueber operative Eingriffe bei der Pneumatocele der Parotis und des Duktus Stenonianus, Deutsche Ztschr. f. Chir. **119**: 201-220, 1912.

Bacterial Agents.—With the rapid strides made in bacteriology, public health and preventive medicine, occupational hazards of a bacterial nature have become rare. Bacterial infection directly related to occupation is of primary concern when animals or animal products are handled. Anthrax, hoof-and-mouth disease and glanders are less often seen today because of the preventive measures taken.

THE PHYSICAL STATE OF THE ETIOLOGIC AGENT

The smaller the size and the greater the state of dispersion of the particles of which the etiologic agent is composed, the greater the surface area and the more severe the effects. Table 3 shows the range of the physical state from solids to rays.

The harmful oral effects produced by dusts of organic or inorganic nature range practically through the entire gamut of pathologic lesions [44] and are enumerated and presented in table 5.

Mode of Entry.—There are three channels by which the noxious agents can enter the system—inhalation in the case of gases, fumes or dust; ingestion in the case of solids or liquids, and, much more rarely, absorption directly through the skin in the case of mercury and benzene (fig. 10).

These modes of entry are significant because they determine the severity of the effects. Local effects are illustrated by the direct action of dusts or acids in the

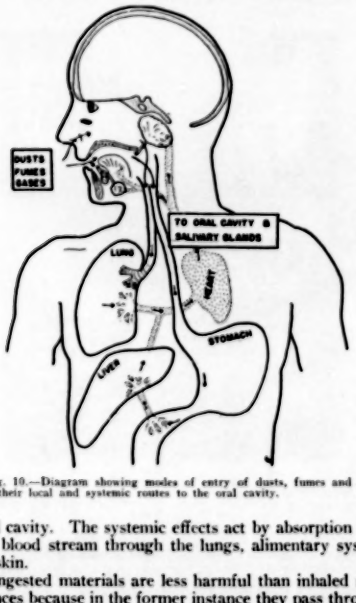

Fig. 10.—Diagram showing modes of entry of dusts, fumes and gases and their local and systemic routes to the oral cavity.

oral cavity. The systemic effects act by absorption into the blood stream through the lungs, alimentary system or skin.

Ingested materials are less harmful than inhaled substances because in the former instance they pass through the liver before gaining entrance into the systemic circulation. Once these substances are in the blood stream their mode of action may vary. For example, carbon monoxide or aniline alter the constituents of the blood and produce a cherry red or blue coloration of the oral mucosa, while lead and mercury are merly transported through the blood stream or saliva into the oral tissues.

OCCUPATIONAL DISTRIBUTION

For each occupation in which oral disease occurs there is usually one outstanding etiologic agent, although not infrequently two or more agents may be acting together. In table 4 some of the important occupations have been selected which illustrate the variety of oral lesions that may occur.

TABLE 5.—*The Various Effects of Dust on Oral Structures*

Local or Systemic Action	Mode of Action	Oral Effects
Through local action	Accumulation on surface (metals)	Staining of enamel, pigmentation of oral mucosa
	Coarse grit (coal, cement)	Abrasion
	Fermentation (sugar)	Caries
	Silica for precipitate (flour)	Calculus
	Irritation	Gingivitis, cheilitis
Through blood stream	As, Hg, P (+ infection)	Osteomyelitis of jaws
	Mercury compounds (+ gingivitis)	Gingivostomatitis
	Heavy metals (+ hydrogen sulfide)	Heavy metal line in gingivae

For the purposes of this report, no attempt was made to present an exhaustive list. A detailed comprehensive enumeration of the occupations and their characteristic oral hazards, however, would serve as a useful guide to industrial physicians and dentists.

THE IMPORTANCE OF ORAL HYGIENE

Oral manifestations of occupational origin are readily predisposed and aggravated by neglect of oral health, and the problem of prevention of oral occupational hazards must be attacked both by improving the working conditions and by establishing and maintaining oral health.

The presence of the etiologic agent alone is not enough to cause oral disease. The general and the oral health of the patient are equally important.

An analysis of the various oral manifestations of occupational disease reveals the recurrent theme that in the presence of optimal oral health these manifestations are minimal or entirely absent. The significance of oral health in preventing oral disease is indicated in the following formulation:

$$\text{Etiologic agent of occupational origin} \times \text{Poor oral health} = \text{Oral occupational disease}$$

Thus oral health is more than an additive or reducing factor in the production of oral occupational disease; it is a controlling factor. The lead line or mercurial stomatitis, to cite a few examples, is prominent, mild or absent depending not only on the dose and intensity of the etiologic agent but to an equally significant extent on the degree of oral health. Complete elimination of poor oral health gives this factor a value of 0 and therefore prevents oral occupational disease, just as tubercle bacilli alone in the healthy person will not produce tuberculosis.

Experimental evidence of this relationship has been presented by Goadby,[18] who was able to control the lead line at will by modifying gingival health. In an investigation in which cats were exposed to inhalation of lead dust and developed lead poisoning, Goadby found no lead line. He modified his experiment by

44. Weinberger, Walter: Ueber gewerbliche Schädigungen im Bereiche der Mundhöhle, Ztschr. f. Stomatol. **32**: 196-201, 1934.

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placing ill fitting gold crowns about several teeth of the animals, which were then exposed to lead. In a very short time and before any other signs of lead poisoning, definite blue lines appeared in the inflamed gingivae about the crowned teeth.

The scope of this paper does not include a consideration of treatment. However, it is recognized that prevention is the most important and efficient method of treatment. Prevention can be effected by proper working conditions and by strict oral hygiene. The latter should begin before admission into a particular occupation and should continue throughout the course of the employment period. Moreover, the training for a particular occupation should include attention to the general health of the worker and the particular health of those parts of the body which are exposed to oral occupational hazards. Oral hygiene is an essential part of industrial hygiene.

Grow and Armstrong [45] in their recent work on "Fit to Fly" give the following instructions to aviators, which could well serve as a guide to all workers:

> No matter how apparently sound, the teeth should be checked at regular six month intervals by a competent dentist. Dental hygiene should be maintained daily.

The various oral occupational lesions considered in this report present a challenge to the authorities in industrial and public health to provide adequate measures for the prevention, early recognition and treatment of oral occupational disease.

SUMMARY AND CONCLUSIONS

1. The problem of oral manifestations of occupational origin must be considered according to the pathologic process, structure affected, etiologic agent and occupational distribution.

2. The oral cavity is a chief port of entry for occupational noxious agents. All medical examinations of industrial workers should therefore include an oral examination.

3. In the study of occupational disease an examination of the oral cavity offers the following advantages:

(*a*) The oral cavity is easily accessible.

(*b*) Local effects are readily recorded in exposed enamel and dentin and in the soft structures. The record in the enamel and dentin is often permanent and may reveal past occupational exposures.

(*c*) Systemic effects may be transmitted in the oral cavity through the blood stream and the saliva and are often manifested in characteristic symptoms.

4. Poor oral hygiene renders the worker more susceptible to oral occupational hazards. These hazards are minimized in the presence of oral health. Oral hygiene is an essential part of industrial hygiene.

5. Adequate provisions for industrial health should include the prevention, the early recognition and the treatment of oral occupational diseases. The problem of reducing oral occupational diseases should, therefore, be met by (*a*) improving working conditions and (*b*) establishing and maintaining optimal oral and general health.

6. Further studies of oral occupational disease should be conducted in order to check or confirm previous reports and to discover possible manifestations arising in new industries.

808 South Wood Street.

45. Grow, M. C., and Armstrong, H. G.: Fit to Fly, New York, D. Appleton-Century Company, Inc., 1941.

Clinical Notes, Suggestions and New Instruments

MYASTHENIA GRAVIS OCCURRING IN AN INFANT BORN OF A MYASTHENIC MOTHER

FRED L. STRICKROOT, M.D.; ROBERT L. SCHAEFFER, M.D., AND HOWARD L. BERGO, M.D., DETROIT

Up until the time that it was discovered that symptoms of myasthenia gravis were ameliorated by the administration of a parasympatheticomimetic drug, the number of cases of this disease reported was small. Although physostigmine definitely benefited patients with this neuromuscular disorder, its side effects were so undesirable that they precluded adequate treatment. Not until 1935, when Dr. Mary Walker [1] of Greenwich, England, first used prostigmine methylsulfate on a myasthenic patient, was there a suitable drug found to treat the condition.

Although the number of such patients who have since been observed is rapidly increasing, owing in part to a suitable diagnostic test,[2] only a few patients who became pregnant have been carefully observed. Viets, Schwab and Brazier [3] have recently reviewed the literature on this subject and state that pregnancy has a favorable effect on the course of the disease, often amounting to a definite remission. In discussing the question of whether or not to abort a pregnant woman who has myasthenia gravis, these authors [3] cite the case of a woman who had an abortion performed on the hypothesis that the disease might be transmitted to the child. As far as can be ascertained, there has been no evidence in the literature to lead one to believe that such is ever the case.

However, a myasthenic woman has recently been observed through a pregnancy and delivery of a child with seemingly typical symptoms of myasthenia gravis:

REPORT OF CASE

History.—M. G., a white girl aged 19, on Feb. 3, 1939 complained chiefly of extreme weakness. Her past history showed that she had experienced an essentially normal childhood and adolescence. At the age of 8 years she sustained a fractured arm which healed normally. When she was 10 or 11 a vague smothering feeling was often noted during hot weather. She had measles, mumps and chickenpox in rather rapid succession at the age of 12, but none were very severe and there were no complications. Growing pains were rather frequently complained of during childhood, although apparently she had normal strength during this period.

Two years before the onset of the present illness her mother considered her thin and somewhat undernourished, despite the fact that her weight reached about 120 pounds (54 Kg.) during the summer months. In 1937, when she was 17 and was beginning her senior year in high school, she first noted the onset of weakness in the knees when climbing stairs, and finally on several occasions her knees collapsed completely before she reached the top of the stairs, causing her to fall. She did not seem to have the strength to aid herself or even to reach for assistance when she began to fall, and following such an incident she was unable to rise for about ten minutes. Diplopia was usual at the time of falling. Shortly after this group of symptoms appeared the patient began to complain of extreme fatigue especially prominent in the muscle groups of the upper extremities and head. Mastication became a real effort and she had to assist the jaw muscles manually when eating, a procedure which took considerable time. After a few minutes of conversation her voice would become nasal and her speech slurred. Writing became almost impossible, and a simple procedure such as combing her hair or removing her dress caused extreme muscular exhaustion. Soon she was unable

1. Walker, Mary B.: Case Showing Effect of Prostigmine on Myasthenia Gravis, Proc. Roy. Soc. Med. **28**: 759 (April) 1935.
2. Viets, H. R., and Schwab, R. S.: Prostigmine in Diagnosis of Myasthenia Gravis, New England J. Med. **213**: 1280 (Dec. 26) 1935. Viets, H. R., and Mitchell, R. S.: Prostigmine Test in Myasthenia Gravis, ibid. **215**: 1064 (Dec. 3) 1936. Viets, H. R., and Schwab, R. S.: The Diagnosis and Treatment of Myasthenia Gravis, J. A. M. A. **113**: 559 (Aug. 12) 1939.
3. Viets, H. R.; Schwab, R. S., and Brazier, Mary A. B.: The Effect of Pregnancy on the Course of Myasthenia Gravis, J. A. M. A. **119**: 236 (May 16) 1942.

to turn in bed or rise from a horizontal to a sitting position. She volunteered the information that she believed that her strength was nearly normal for a few seconds after beginning any activity but that extreme fatigue almost invariably occurred before such activity could be carried to completion. A loss of 10 to 12 pounds (4.5 to 5.4 Kg.) during the past year was noted. Muscular pain was not experienced. Two months prior to her first visit she fell, injuring her head so severely that roentgenograms of the skull were deemed advisable. They showed no demonstrable abnormalities. Although dizziness was absent, the patient stated that she had transient deafness, usually when listening to the radio, which could generally be relieved by placing her head between her knees for a few minutes.

Both parents were living and in good health. Nothing in the family's past history relevant to the patient's illness was elicited.

A systemic review of the patient revealed nothing of importance except that she always had complained of cold hands and feet. Her grades in school were always passing, although lately they had not been as high as before.

Physical Examination.—The patient was thin and undernourished. The skin was dry and pale. The distribution of body hair was typically female. The hair on the head was still normal in amount but not quite as thick as prior to the onset of the present illness. Her weight was 105 pounds (48 Kg.); her height 66 7/10 inches (169 cm.); span 68 inches (173 cm.); upper measurement 32 7/10 inches (83 cm.), and lower measurement 34 inches (86 cm.). The oral temperature was 98 F., pulse rate 75 a minute and the respiratory rate 18 a minute.

The head was well formed but the cheeks were somewhat hollow and the face had a drawn, drooped expression. The external ears were well formed and close to the head; both auditory canals were clear of obstructions and both drums appeared normal. The pupils were quite large, regular and equal and reacted normally to light and in accommodation. Ophthalmoscopic examination revealed nothing abnormal and the extraocular movements were normal. The nose was well formed, with no gross obstruction to breathing. The mouth exhibited seemingly normal teeth with slight spacing and crookedness of the upper incisors. The oral mucous membranes showed no abnormality; the tonsils were small and noninflamed and the pharynx was normal. No cervical or general adenopathy was demonstrable. The thyroid gland was neither visibly nor palpably enlarged, and there were no signs of thyrotoxicosis.

The chest was fairly well formed with the breasts well developed and out of proportion to the general configuration of the body. Chest expansion was normal and equal. The percussion note was normal and breath sounds were normal vesicular but somewhat subdued and faint. The heart was not enlarged to percussion; heart sounds were of good quality with no arrhythmia; a faint, soft, sharply circumscribed systolic murmur was heard in the pulmonic area. Blood pressure was 115 systolic and 75 diastolic.

Examination of the abdomen revealed no masses or points of tenderness. The liver, kidneys and spleen were not palpable.

The reflexes were essentially normal throughout except that the biceps and triceps were somewhat hyperactive bilaterally. During the course of the examination the patient's voice became definitely more nasal.

Laboratory Examination.—Urinalysis February 9 revealed a yellow and cloudy appearance; specific gravity 1.023; reaction acid, and sugar, albumin and bile negative. The centrifuged sediment contained a few squamous epithelial cells, a small number of pus cells and amorphous urates.

A blood count February 8 showed red blood cells 3,610,000 per cubic millimeter, hemoglobin (Sahli) 75 per cent, leukocytes 6,850 per cubic millimeter, with a differential count of polymorphonuclear neutrophils 54 per cent, small lymphocytes 44 per cent and large mononuclears 2 per cent.

Blood sugar was 87 mg. per hundred cubic centimeters of blood, blood nonprotein nitrogen was 32 mg., blood cholesterol 182 mg. and blood chlorides 471 mg. The Kahn reaction of the blood was negative. The basal metabolic rate was minus 9.4 per cent and on the next day minus 0.8 per cent.

A roentgen examination of the skull showed that the sella turcica measured 9 mm. in the anteroposterior diameter by 8 mm. in the cephalocaudad diameter. The floor and the clinoids were well formed with no erosion. The clinoids were not approximated. Roentgenograms of the long bones for epiphysial closure showed that all epiphyses of the wrist were completely united, including the distal epiphyses of the radius and ulna. All epiphyses of the knee were completely united. Roentgenograms were made of the chest to determine the condition of the thymus. The chest was sthenic in type; the heart was vertical; there was no sign of a persistent thymus gland and no evidence of pulmonary morbid anatomy.

Course.—While the laboratory work was being done in the office, 1 cc. of 1:2,000 prostigmine methylsulfate was injected subcutaneously, due precaution being taken to make the patient think that this was part of the diagnostic procedure and not for treatment. Five minutes later she was asked to attempt to climb the stairs, and after some coaxing she did so without assistance from the railings; her mother remarked "She hasn't done that in months." Continuous gum chewing for more than a half hour caused no fatigue. At the same time the facies changed remarkably and the drawn expression disappeared. A diagnosis of myasthenia gravis was made and the patient was placed on 1 or 2 ampules of prostigmine methylsulfate 1:2,000 injected daily and 15 mg. of prostigmine bromide by mouth twice a day. During the first week the tablets were increased to 3 or 4 daily, depending on the symptoms, and at the end of the week the injections were discontinued. Oral treatment was then continued at the same dosage and the patient was well maintained for about a year and a half, at which time she began to decrease the dose until 1 or 2 tablets daily would suffice, except for short periods when drooping of the lids, strabismus, diplopia or weakness of the arms made a temporary increase of dosage necessary. In April 1941 she was married, and in September she came for examination in the second month of pregnancy. She was referred to Dr. Bergo for obstetric care. Throughout her pregnancy it became necessary to increase dosage of the prostigmine bromide gradually until 6 or 8 tablets daily was necessary near term. Otherwise, pregnancy was uneventful. She was carried through a normal labor and delivery quite uneventfully with prostigmine bromide, taking 4 tablets during the eight hours preceding delivery on April 7, 1942.

The baby (a girl, weight 7 pounds 8 ounces [3,402 Gm.]) was well formed and apparently normal. However, some difficulty was experienced on the third day in getting the baby to take its formula. On the fourth day a decided change was noted. The face became masklike; the facial muscles seemed to lose all tone. On stimulation the baby cried almost noiselessly, with no expression or movement of the facial muscles. The lower jaw remained dropped. The baby could not seem to form the lips for nursing. The small amount of formula which did get into the mouth was regurgitated. Mucus collected in the throat and had to be frequently aspirated. The baby did not sleep but was quite inactive and cried, or attempted to cry, frequently, although with little noise and no facial expression. With myasthenia gravis in mind, we injected by gavage a test dose of ¼ tablet of prostigmine bromide in an ounce (30 cc.) of formula. The response within half an hour was dramatic. All symptoms disappeared and the baby nursed and took the bottle normally and on stimulation cried with volume and with the normal expression of a crying baby. The effect was maintained by the addition to each four hour formula of a half teaspoon of a mixture containing a 15 mg. tablet to each half ounce (15 cc.) of water. The baby gained well for two days and then prostigmine bromide was discontinued for two feedings. The symptoms returned, although in a milder degree, within eight hours, and prostigmine bromide was again ordered, the first dose to be 1 teaspoon of the mixture described. The baby responded as before, and half an hour later took 2 ounces (60 cc.) of its formula. About forty-five minutes later she suddenly turned blue and died, after a Drinker respirator, prostigmine, atropine and adrenal cortex extract had proved useless.

An additional report on the mother was obtained April 29: She had required 4 tablets daily for maintenance until, on April 26, drooping of the lids was experienced before each

tablet was due, with continuous blurred vision. Increasing the dosage to 2 tablets for the next three doses gave relief. Maintenance now consists of 4 or 5 tablets each day.

AUTOPSY REPORT ON THE BABY

Autopsy was performed April 14. A critical external examination did not reveal any evidence of injury or violence. The umbilical cord was still in place and tied with linen cord. It was followed as far as the liver and showed no evidence of abnormality whatever. The body was in firm rigor mortis and showed stasis of blood in its dependent portions.

Gross Examination.—The head showed very faint typical forceps markings; otherwise no gross anatomic deviations were noted. A semilunar incision connecting the two mastoid processes was made. The soft parts of the scalp were reflected and the skull cap was removed with the saw, thus exposing the brain. The meninges and the venous sinuses were congested. The spinal fluid in the subarachnoid space had a mild xanthochromic color. The surface of the brain was extremely edematous and very small petechiae were seen in the base of the brain over the medulla and pons.

The thoracic cage showed no gross anatomic changes. Inspection of the thoracic cavity revealed that its organs were of normal size and configuration and were in their normal position. Both lungs were free in their respective pleural sacs and were deep bluish mottled brown. On section the cut surface was smooth, moist, congested and edematous, with diffuse small areas of atelectasis which were more pronounced in the lower lobes. Sections from these areas when immersed in water did not float. The large pulmonary arteries and veins were filled with blood.

The pericardial sac contained about 2 cc. of clear, straw colored fluid. The heart showed no gross anatomic changes. The foramen ovale and the ductus arteriosus were closed. The thymus was found in the anterior mediastinum. It had an approximate weight of 12 Gm. On section the cut surface was of glandular architecture and slightly congested.

Inspection of the abdomen revealed the abdominal organs to be of normal size and shape and in their normal position. The liver was a light brown and on section showed congestion and very mild cloudy swelling. The bile passages, bile ducts and gallbladder were filled with green bile and showed no gross anatomic changes. The pancreas was a grayish pink and on section showed no gross anatomic changes. The spleen had a lilac color. On section its cut surface was semifirm and congested. Both adrenals showed cloudy swelling, with the right adrenal exhibiting a large hemorrhage which involved both medullary and cortical zones. Both kidneys showed classic fetal lobulations. On section they were a grayish brown and showed congestion. The ureters throughout their length showed no gross anatomic changes. The ovaries, tubes and uterus showed no gross anatomic changes.

The diagnosis was (1) edema of the brain with small petechiae over the medulla and pons, (2) patchy atelectasis of the lungs, (3) hemorrhage of the right adrenal and (4) diffuse congestion and cloudy swelling of the remaining organs.

Microscopic Examination.—Section of the myocardium showed cloudy swelling and congestion. The brain through the third ventricle showed edema, definite congestion and extravasation of blood outside one of the larger vessels. The kidney showed cloudy swelling and definite passive congestion. The liver showed cloudy swelling and congestion of the central veins. The spleen showed passive congestion. The adrenal showed diffuse blood extravasation in the zone of the medulla. The lungs showed diffuse atelectasis, congestion and bronchiectasis. Many alveoli were filled with serum and red blood cells. Striated muscle showed slight cloudy swelling and capillary congestion. Section through the cerebellum showed congestion of meningeal vessels and slight subarachnoid extravasation of blood. Section of the thymus showed definite congestion with a mild degree of hyperplasia of the thymic corpuscles. There was also mild hyperplasia of the lymphoid parenchyma.

The diagnosis was (1) edema, congestion and petechial hemorrhages of the brain, (2) atelectasis of the lungs, (3) diffuse cloudy swelling and congestion of the remaining organs and (4) mild hypertrophy of the thymus with hyperplasia of the thymic corpuscles.

COMMENT

The diagnostic criteria of myasthenia gravis are generally considered to be on a symptom basis. Microscopic examination of tissue from patients dying with the condition usually shows little if anything of a specific nature. Accordingly, until the introduction of the diagnostic test of Viets and Schwab using prostigmine, the diagnosis was often in doubt. It is generally conceded at the present time that if a patient has characteristic symptoms of myasthenia gravis and responds favorably to the prostigmine test that patient has myasthenia gravis. There is no other neuromuscular disease of similar nature which is known to respond to prostigmine in such a fashion.

According to these criteria, the baby under discussion had this condition, for the requirements of the test were fulfilled. This, to our knowledge, is the first instance to be reported in the literature of myasthenia gravis occurring in a newborn infant. All infants born of myasthenic mothers should be carefully studied in an attempt to find more such cases and thus possibly to aid in furthering our knowledge of this disorder.

1727 East Jefferson Avenue.

MYASTHENIA GRAVIS WITH ACUTE FULMINATING ONSET IN A CHILD FIVE YEARS OLD

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This case of myasthenia gravis is presented because of several unusual and interesting features associated with it. This disease entity, although uncommon in children, occurs with sufficient frequency for it to be borne in mind when one is confronted with sudden acute dyspnea in children.

REPORT OF CASE

History.—J. T. W., a Negro boy aged 5 years was admitted to the Pediatric Service of the Johns Hopkins Hospital shortly after noon of July 6, 1942 with a history of sudden onset of inability to talk clearly or swallow and "rolling of the eyes."

The patient was born by normal spontaneous delivery. He received breast feeding during the first six months followed by bottle feedings with orange juice and cod liver oil daily. His subsequent growth and development was apparently normal in all respects and in general he was a healthy and obedient child. His only known illness prior to the present one was chickenpox at the age of 3 years. His only immunization was smallpox vaccination at the age of 6 months.

Present Illness.—The child was perfectly well until the morning of July 6 (the day of admission). After eating breakfast as usual he went out to play. During the course of the morning he came into the house and asked for "soda pop," a bottle of which was kept in the ice box. He drank this without difficulty. Then he spied a piece of chicken, asked for it and got it. He bit a piece but was unable to swallow it. His eyes rotated upward and his mother "thought that he was going to die." She asked him what the matter was, and he responded "Nothing," but his mother noticed that his speech was thick, stuttering and halting. He went outside but did not play. He simply lay on the grass. He was offered food, attempted to eat and retain it but vomited. He seemed quite drowsy and got increasingly worse with "his eyes all off skew," unable to swallow and unable to make intelligible sounds. He could not sleep because of "pain in his eyes." His bowels became quite loose and he passed six watery, nonbloody stools. In the afternoon he was taken to a physician in the neighborhood, who referred him to this hospital. There was no preceding history of headache, nausea, vomiting or diplopia.

Physical Examination.—The temperature was 37.4 C. (99.3 F.). The pulse rate was 100. The respiratory rate was 28. The blood pressure was 108 systolic, 80 diastolic.

The patient was well developed but scrawny. He lay motionless on the table, swallowing occasionally with difficulty. One noticed immediately the ocular palsy and bilateral ptosis. The skin was moist, warm and of good turgor. The axillary and inguinal nodes were slightly enlarged. There was nothing

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abnormal seen in the head or ears. There was ptosis on both sides, which was transitory, and also a left abducens palsy, which was not constant. The eyes moved irregularly and conjugately, but occasionally one would move erratically. He complained of diplopia. The pupils were large and equal, and they reacted sluggishly to light. The consensuals were intact. Ophthalmoscopic examination showed bilateral blurring of the nasal margins of both disks. No elevation of the disks was observed. There was nothing abnormal seen in the nose. The pharynx was slightly injected. The tongue protruded in the midline. The gag reflex was not present. The patient swallowed with great difficulty and choked on trying to swallow water. There was pronounced dysarthria; his speech was almost completely unintelligible. No stiffness of the neck was present. When the body was raised, however, there was pronounced head drop. The trachea was in the midline. The thyroid was not palpably enlarged. The chest was long and narrow. There were no beading, flaring or other deformities present. The breath sounds were unimpaired. No rales were heard. The percussion note was resonant. No pronounced or impaired fremitus was heard. The heart and abdomen were normal. All the reflexes were hyperactive. The Babinski reflex gave a flexor response. The Kernig sign was negative. Decided ptosis of both lids was present as well as inconstant palsy of the left sixth nerve. Considerable involvement of the muscles of the tongue and the muscles of deglutition was noted. One observer felt that there was a definite facial weakness on the left side.

The diagnosis at this stage still remained obscure. Among the possibilities offered were tuberculous meningitis, encephalitis, ruptured congenital cerebral aneurysm and a pontine lesion.

Laboratory Examination.—Lumbar puncture about three hours after admission showed clear spinal fluid under no increased pressure. The Pandy reaction was negative. Two hundred and fifty crenated red blood cells per cubic millimeter were found: no white blood cells or organisms were seen on the smear. Protein was 15.1 mg. per hundred cubic centimeters. Sugar was 53 mg. per hundred cubic centimeters. No growth aerobically or anaerobically was reported subsequently. Examinations of the blood revealed 11 Gm. of hemoglobin, 4,500,000 red blood cells and 20,126 white blood cells with 86 per cent adult polymorphonuclears, 5 per cent immature polymorphonuclears, 5 per cent lymphocytes, 2 per cent monocytes and 2 per cent eosinophils. The smear showed normocytic, slightly hypochromic red cells with no anisocytosis or stippling. A sickle cell preparation showed no sickling. The urine was clear, with a specific gravity of 1.035. There was no albumin or sugar, but the acetone was 3 plus. Considerable amorphous precipitate was present, but no formed elements.

X-ray examination of the skull and sella region appeared normal with no evidence of fracture seen. The heart and aorta were normal in size and shape; the lungs were clear.

Course.—Following the lumbar puncture, the child became much drowsier and was unable to take anything by mouth. He was unable to expectorate his saliva and had difficulty in swallowing it. His neck became slightly stiff, the Kernig sign slightly positive. Ptosis became even more pronounced.

His condition was much the same on the following day and no new developments arose to indicate the underlying disease state. Gavage with 200 cc. of formula feeding was done about 1 p. m. and shortly thereafter, while he was lying flat, the feeding welled up into the nasopharynx and pharynx with choking and extreme respiratory distress. This was immediately suctioned out with relief of symptoms. Subsequently, during the afternoon, he was much distressed by accumulation of mucus in his throat.

About 6 p. m. of his second day in the hospital the patient suddenly jumped up in bed clutching his throat, rolling his head and twitching his shoulders convulsively, throwing himself about the bed and breathing with extreme effort and making crowing sounds. At one time obstruction became complete and he was quite cyanotic. Suctioning was again immediately instituted, a tracheotomy set opened up and I was sent for to perform an emergency tracheotomy. When I arrived about three or four minutes later, the acute laryngeal obstruction had subsided and the child was lying prostrate in bed with extremely shallow respirations, almost completely abdominal.

The history, symptoms and sequence of events suggested myasthenia gravis, and it was decided to try a test dose of prostigmine before doing a tracheotomy. The effect was most dramatic. Within six minutes after an intramuscular injection of 0.5 mg. of prostigmine methylsulfate, the ptosis had disappeared and his speech had cleared remarkably. Fifteen minutes later the patient sat up in bed, asked for a bottle of soda pop and was alert, awake and able to walk across the floor unaided. There was no longer any doubt about the diagnosis. His next dose of prostigmine methylsulfate, 0.5 mg., was given approximately three hours later, at which time muscular weakness had begun to reappear; again he improved dramatically following the injection of prostigmine. Throughout the night he was given 0.5 mg. of prostigmine methylsulfate intramuscularly every two hours. On the following day prostigmine bromide by mouth was substituted, and since then symptoms have been kept in abeyance by oral administration of prostigmine bromide.

Beginning with a dosage of 30 mg. of prostigmine bromide every three hours, the amount has been gradually reduced through 15 mg. every four hours until now the child is being maintained on a dose of 7.5 mg. every twelve hours.

At the time of this writing, approximately eight weeks after admission to the hospital, the child is up and about, fully active and alert, and, except for a slight droop of the lids, has no visible evidence of his disease.

COMMENT

The features of the case of specific interest to the otolaryngologist are sudden acute onset of respiratory distress, to such a degree that an emergency tracheotomy was requested by the attending pediatricians, the sudden fulminating onset of the disease and the age of the patient.

The occurrence of respiratory distress in patients with myasthenia gravis is well known. Approximately four weeks before the admission of this patient I was called in consultation to see a twenty-four hour postoperative thymectomy patient in the surgical service with a view to possible bronchoscopy or tracheotomy. The patient, with a known preoperative diagnosis of myasthenia gravis, had developed severe respiratory distress with laryngeal stridor and cyanosis. When seen, she was in every way a counterpart of the subject of this report. She had been given prostigmine just before being seen, and after a few minutes her respiratory function had so improved that indications for a tracheotomy were no longer present. Again after about six hours she had another episode of respiratory distress, which was again relieved satisfactorily by prostigmine.

In a case reported by Levethan, Fried and Madonick[1] respiratory distress and cyanosis were a prominent feature on the first admission to the hospital; these symptoms were completely relieved by administration of prostigmine methylsulfate but recurred soon after the drug was stopped. Respiratory distress was again a prominent symptom when the patient was admitted for the second time. This was partially relieved by placing the child in a respirator plus administration of the drug, but only for a period of about thirty-six hours. Respiratory failure again set in and, despite large doses of prostigmine, the child died.

The mechanism of the production of the respiratory distress was the same in all of the 3 cases cited: in 2 the condition was known to be myasthenia gravis before entrance to the hospital, whereas in our case the same signs and symptoms appeared within a few hours after the onset of illness. In our case no diagnosis was made until the trial dose of prostigmine proved the nature of the illness.

The symptoms of myasthenia gravis follow for the most part a rather constant and well defined pattern and are characterized chiefly by the insidious onset of symptoms. In the article by Levethan, Fried and Madonick a review of the salient features in 34 cases of this condition in children is given. In the majority of the cases the onset of symptoms was insidious. No mention is made of any case with a sudden onset in any way comparable to the case described here. "Fatig-

1. Levethan, S. T.; Fried, A. J., and Madonick, M. J.: Myasthenia Gravis: Report of a Case in Which Prostigmine Methylsulfate Was Used, Am. J. Dis. Child. 61:770 (April) 1941.

ability, general muscular weakness and weakness of the ocular muscles comprised the initial complaints in 73 per cent of the cases. Disturbances of speech and of deglutition were found to be late appearing symptoms." [1]

I have been unable to find any report in the literature of a case of myasthenia gravis whose onset was as acute as that of the subject presented. Although the patient exhibited almost all the signs and symptoms of a classic case of myasthenia gravis, they were so compressed within such a short period of time (forty-eight hours) that diagnosis was obscure and uncertain and proved only when the prostigmine was given. The occurrence of myasthenia gravis, although not common, is of sufficient frequency to be kept in mind. Rothbart [2] in 1937, reporting on the familial incidence of myasthenia gravis in children, mentioned the onset of symptoms as occurring in early infancy in 2 of his cases. In a review of 87 cases observed by Kennedy and Moersch [3] between 1915 and 1932 the age of the youngest patient was 10 years, with the greatest incidence occurring within the third and fourth decades. Viets and Schwab,[4] in a report of 70 cases of myasthenia gravis observed from 1905 to 1939, similarly report their youngest patient as 10 years of age with the highest incidence occurring in the second and fifth decades. More recently Levethan, Fried and Madonick in a case report reviewed the literature of this disease as related to children. They were able to collect from the literature only 34 cases under the age of 17 years. The average age in their cases was 11.8 years, and only 8 patients were under 10 years of age.

SUMMARY

In a case of myasthenia gravis in a 5 year old child the outstanding features were sudden respiratory distress and the dramatic response to prostigmine, the acute, fulminating onset of the disease and the early age of the patient.

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THE TYPHOID CARRIER STATE TREATED WITH SULFAGUANIDINE

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There are conflicting reports in the recent medical literature concerning the efficacy of sulfaguanidine in the treatment of the typhoid carrier state. The initial paper by Levi and Willen [1] advocating the use of sulfaguanidine for the treatment of typhoid carriers was followed by two articles, mentioned later, which opposed this form of therapy.

Levi and Willen administered 0.5 Gm. of sulfaguanidine per kilogram body weight every eight hours for one week to a biliary and intestinal typhoid carrier who underwent cholecystectomy before the drug was used. Cultures taken of 10 specimens of feces, 3 of them after the use of magnesium sulfate, gave negative results. Specimens were taken between three and thirty-two days after cessation of treatment. The authors stated "This method of therapy is worthy of further trial."

Ten months later, Saphir and his associates [2] reported the treatment of 5 intestinal carriers with sulfaguanidine in a manner similar to that used by Levi and Willen. They gave the same dose four times a day over a period of two weeks. The blood level of sulfaguanidine did not exceed 1.2 mg. per hundred cubic centimeters. "The results were uniformly unsatisfactory. In all cases in which treatment was given the bacillary excretion continued unabated." [2]

Cutting and Robson [3] treated 6 typhoid carriers with several drugs including sulfaguanidine and reported negative results. One carrier had had a cholecystectomy before treatment. Since examinations of bile for typhoid bacilli were not performed in any case, it was not determined whether the persons with gallbladders were intestinal or biliary carriers. Since sulfaguanidine could be effective only in intestinal carriers, these cases hardly constituted a fair test. No patient received more than 12 Gm. of the drug daily.

My purpose in this report is, first, to swing the balance back in favor of the use of sulfaguanidine in the cure of intestinal carriers of Eberthella typhosa and, second, to present a somewhat different technic of treatment.

REPORT OF CASES

CASE 1.—B. M. I., a girl aged 17 years of Japanese descent, was a healthy typhoid carrier to whom was traced a recent epidemic of typhoid occurring in a junior high school.[4] The patient and her parents stated that she had never had typhoid. Her father, with whom she lived, also was discovered to be a typhoid carrier. Specimens of feces on four consecutive days were found to contain E. typhosa. The organism was agglutinated by an antityphoid serum in dilutions of the latter as high as 1:10,240.

She was admitted to the hospital on March 19, 1942 without clinical manifestations of disease. Laboratory investigations in this hospital consisted of blood, feces, urine and biliary cultures. Cultures of one blood specimen and 5 urine specimens failed to reveal the presence of E. typhosa. Three specimens of bile obtained by the duodenal tube before the institution of treatment and 3 obtained after cessation of the second course of treatment were free of E. typhosa. The flow of bile was variously stimulated by magnesium sulfate, bile salts and olive oil because it was thought that the first named might have an inhibiting effect on the growth of E. typhosa. On March 31 sulfaguanidine 2 Gm. four times a day was administered, and on April 5 its administration was discontinued. Daily specimens after treatment ceased showed no E. typhosa until a specimen obtained on April 12 yielded typhoid bacilli on culture. It was then decided to institute another course of treatment with greater doses of the drug. Therefore 4 Gm. of sulfaguanidine was given five times during the day, making a total daily dose of 20 Gm. The drug was given for a period of six days. Two specimens of feces were obtained while the patient was undergoing the second course of treatment. Cultures of both showed no E. typhosa. Cultures of feces specimens obtained on fourteen occasions since cessation of the second course of treatment all failed to reveal E. typhosa. The last specimen was obtained forty-three days after treatment. Three specimens of the patient's feces were obtained after stimulation of defecation by various cathartics—magnesium sulfate, cascara and aloin were each used once. The blood level of sulfaguanidine during treatment was 2.48 mg. per hundred cubic centimeters. At no time during either course of treatment did she have any clinical or laboratory manifestations of undesirable effects of therapy. Urinalyses and blood counts during and after treatment showed normal results.[5]

CASE 2.—D. H., a boy aged 14 years of Japanese descent, had been sick at home with mild typhoid which was unrecognized until it was discovered that he had been the source of the only secondary case in the typhoid epidemic referred to in case 1. He had no clinical manifestations of disease. His serum agglutinated E. typhosa in a dilution of 1:1,280. Two cultures of bile and 6 of urine showed absence of E. typhosa. Treatment was instituted exactly as in case 1. Urinalyses and blood counts during and after treatment gave normal results. The patient had five feces examinations before treatment with the presence of E. typhosa demonstrated in each specimen. He had seven feces examinations after treatment (the last specimen

2. Rothbart, H. B.: Myasthenia Gravis in Children: Its Familial Incidence, J. A. M. A. **108**:715 (Feb. 27) 1937.

3. Kennedy, F. S., and Moersch, F. P.: Myasthenia Gravis: A Clinical Review of Eighty-Seven Cases Observed Between 1915 and the Early Part of 1932, Canad. M. A. J. **37**:216 (Sept.) 1937.

4. Viets, H. R., and Schwab, R. S.: The Diagnosis and Treatment of Myasthenia Gravis, J. A. M. A. **113**:559 (Aug. 12) 1939.

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1. Levi, J. E., and Willen, A.: The Typhoid Carrier State Treated with Sulfaguanidine, J. A. M. A. **116**:2258 (May 17) 1941.

2. Saphir, William; Baer, W. H., and Plotke, Frederic: The Typhoid Carrier Problem, J. A. M. A. **118**:964 (March 21) 1942.

3. Cutting, W. C., and Robson, G. B.: The Alleged Efficiency of Medicinal Treatment of Typhoid Carriers, J. A. M. A. **118**:1447 (April 25) 1942.

4. Hoagland, R. J., and Fleming, J. F.: Clinical Aspects of an Epidemic of Typhoid Fever, Hawaii M. J. **1**:307 (May) 1942.

5. Since the article was written, four additional feces examinations have been done on the stools of patient 1, making a total of seventeen examinations. All examinations yielded negative results. The last examination was performed one hundred and four days after the second course of treatment was discontinued.

was examined seventeen days after treatment) with E. typhosa not demonstrable in any specimen.

Since we found[4] that 60 children ill with typhoid all spontaneously ceased to eliminate E. typhosa in their feces, the apparently successful result of treatment of D. H., a convalescent carrier, may have been adventitious. However, the abrupt cessation of constantly positive feces cultures was striking. Moreover, it is noteworthy that the same dosage of sulfaguanidine employed in case 1 produced no clinical or laboratory manifestations of undesirable effects of therapy.

CONCLUSIONS

Two intestinal typhoid carriers—1 a healthy and 1 a convalescent carrier—were treated with sulfaguanidine. It is believed that in case 1 the apparent termination of the chronic healthy carrier state was due to the administration of sulfaguanidine and that in case 2 a similar termination of the convalescent carrier state may have been due to the use of the drug.

Sulfaguanidine should be used in the treatment of the typhoid carrier state in doses as high as 20 Gm. a day if smaller doses are ineffectual.

MASSIVE INTRAMEDULLARY INFUSIONS

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and
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Occasions arise when there is urgent need for massive replacement therapy and the usual methods for administration are not easily available or practicable. The medullary route as advocated by Tocantins[1] is safe and easily and quickly applied, and a minimum of special equipment is required. Intramedullary infusion should be borne in mind more often by those faced with this problem.

Intramedullary therapy is not new. Tocantins and his co-workers have been largely responsible for developing and popularizing this method. Papper and Rovenstine[2] have also advocated this technic for parenteral therapy.

REPORT OF CASE

D. E., a white man aged 32, was admitted to the Station Hospital June 10, 1942 for observation and treatment of a bloody diarrhea. He had a history of recurring attacks since 1936 for which no specific cause or treatment had been found. At the time of admission he was fairly well nourished, there were no signs of acute or chronic loss of blood and the physical examination was essentially negative. The stools were frequent and watery and most of them contained gross blood and mucus. Roentgenograms were typical of an early ulcerative colitis. Proctoscopic examination showed red, friable mucous membrane with multiple small, superficial ulcerations. Many fresh stools were examined for amebas and cysts; not one was found. The flora of the colon was normal. The agglutination tests gave negative results. In spite of all the usual methods of treatment, including a therapeutic test for amebiasis, the disease progressed. The loss of blood continued and on June 22 the first transfusion was given. However, he continued to lose blood, and, between June 28 and July 2, 4,500 cc. of whole blood intravenously was required to maintain his red blood cell count between 2 and 3 million. At this time, the general condition of the patient deteriorated rapidly. There was a rise in temperature and pulse rate, the abdomen became distended and tense; it was impossible to administer food and fluids by mouth. The frequency and volume of the stools increased and he had as many as twenty-five bloody stools in twenty-four hours. The total estimated volume of stools ranged from 1,000 to 3,000 cc. a day for ten days and contained a considerable amount of liquid blood and clots.

At this time the patient was in a profound state of toxemia and shock. He was irrational, incontinent and completely incapable of taking food or fluids by mouth and was rapidly becoming exsanguinated. Surgical intervention was considered inadvisable because of the patient's extremely poor physical status. The peripheral veins, which had never been abundant, were completely collapsed or thrombosed. At this point, replacement therapy constituted the only means for maintaining life. It was felt that the choice for continuing treatment lay between venoclysis by venesection or intramedullary infusion. Intramedullary infusion was the method of choice because of the need for an absolutely reliable technic for a considerable period of time which an irrational patient could not easily disrupt and which would not require the patient to lie flat on his back for prolonged periods.

On July 3 a sternal puncture needle was inserted into the medullary cavity of the sternum. In the first twenty-four hours 2,000 cc. of whole blood and in addition 2,600 cc. of fluids were administered through this needle. The needle was left in the sternum from July 3 until July 8, and during this time 5,525 cc. of whole blood and 8,600 cc. of fluids were administered. Because of the patient's generally improved condition, the needle was then removed and it was possible to give 500 cc. of blood and 1,500 cc. of fluid by venoclysis. On July 9, however, the red blood cell count had dropped to

Transfusions, Infusions, Blood Picture and Estimated Loss by Rectum

	Transfusions in Cc. of Whole Citrated Blood		Infusions in Cc.						
			Intravenous		Intramedullary				
Date	Intravenous	Sternal	0.85% Sodium Chloride	5% Dextrose	0.85% Sodium Chloride	5% Dextrose	Hemoglobin, per Cent	Red Blood Cell Count in Millions	Volume of Bloody Stools, Cc.
6/11	.....	.....	...	.....	...	.....	75	4.75	.....
6/20	.....	.....	...	1,000	...	.....	..	....	.....
6/21	.....	.....	...	1,000	...	.....	..	....	.....
6/22	500	.....	...	1,000	...	.....	90	5.05	.....
6/25	.....	.....	...	.....	...	.....	85	4.62	.....
6/26	.....	.....	...	.....	...	.....	70	5.15	.....
6/28	500	.....	500	.....	...	.....	75	4.09	.....
6/29	500	.....	500	.....	...	.....	..	....	.....
6/30	500	.....	500	2,000	...	.....	55	3.35	.....
7/ 1	2,000	.....	500	2,000	...	.....	55	2.17	.....
7/ 2	1,000	.....	500	2,000	...	.....	55	3.36	1,500
7/ 3	.....	2,000	...	.....	600	2,000	55	2.83	1,350
7/ 4	.....	1,000	...	.....	500	1,000	51	2.72	1,110
7/ 5	.....	.....	...	.....	...	2,000	45	2.82	1,950
7/ 6	.....	2,000	...	.....	300	1,000	45	2.80	3,000
7/ 7	.....	525*	...	.....	200	1,000	48	2.90	720
7/ 8	500	.....	500	1,000	...	.....	50	2.95	2,010
7/ 9	.....	1,000	...	.....	500	1,000	45	1.80	1,170
7/10	.....	1,000	...	.....	500	1,000	43	2.31	1,440
7/11	.....	1,000	...	.....	300	1,000	..	....	810
7/12	.....	500	...	.....	250	1,000	55	3.33	240
7/13	500	.....	500	1,000	...	.....	65	3.93	300
7/14	500	.....	350	.....	...	.....	75	4.85	90
7/15	.....	.....	...	.....	...	.....	70	4.29	No blood
7/16	.....	.....	...	.....	...	.....	75	4.50	
7/17	.....	.....	...	.....	...	.....	75	5.02	
7/18	.....	.....	...	.....	...	.....	75	4.76	
7/29	500	.....	...	.....	...	.....	75	4.70	
7/30	500	.....	250	.....	...	.....	60	3.60	
7/31	500	.....	250	.....	...	.....	60	3.79	
8/ 3	.....	.....	...	.....	...	.....	65	4.90	
Total	7,000	9,025	4,300	11,000	2,950	11,000			

* Reaction after 25 cc. of second transfusion.

1,890,000. It was apparent that extensive replacement therapy would still be needed for a considerable length of time. Therefore, in order to obtain maximum ease and certainty of administration and freedom from discomfort to the patient, the sternal needle was reinserted. This time it was in place from July 9 until July 12, when the patient's condition again permitted its removal. In this period, 3,500 cc. of whole blood and 5,350 cc. of fluids were administered.

From the Station Hospital, Fort Sheridan, Illinois.

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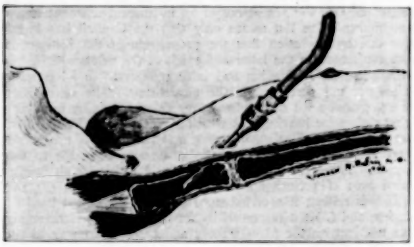
1. Tocantins, L. M.: Rapid Absorption of Substances Injected into the Bone Marrow, Proc. Soc. Exper. Biol. & Med. **43**: 292 (Oct.) 1940. Tocantins, L. M., and O'Neill, J. F.: Infusion of Blood and Other Fluids into the Circulation Via the Bone Marrow, ibid. **45**: 782 (Dec.) 1940. Tocantins, L. M., O'Neill, J. F., and Price, A. H.: Infusions of Blood and Other Fluids Via the Bone Marrow in Traumatic Shock and Other Forms of Peripheral Circulatory Failure, Ann. Surg. **114**: 1085 (Dec.) 1941. Tocantins, L. M.: Infusions Through the Bone Marrow, Clin. Med. **49**: 220 (Aug.) 1942. Tocantins and O'Neill,[3] Tocantins, O'Neill and Jones.[4]

2. Papper, E. M., and Rovenstine, E. A.: Utility of Marrow Cavity of Sternum for Parenteral Fluid Therapy, War Med. **2**: 277 (March) 1942.

During the period that the needle was in place (nine days) a total of 9,025 cc. of whole citrated blood and 13,950 cc. of fluids, a total of 22,975 cc., were administered (shown in the accompanying table). As far as can be determined, this is the largest volume of fluids that has been given to a single patient by intramedullary infusion and the greatest total number of days that a sternal needle has been permitted to remain in place



Cross section of sternum showing position of needle for intramedullary infusion.

The patient was perfectly free to move about in bed without fear of dislodging the needle, and ordinary nursing care was facilitated during these nine days. No discomfort was experienced while fluids were administered by gravity. Rapid injection by means of a syringe while the needle was being irrigated produced a moderate, indefinite sense of pressure. At any time it was possible to withdraw blood for typing or chemistry studies, thus eliminating the necessity for additional venipunctures.

By the most careful criteria, no local or systemic ill effects to the patient were observed after large amounts of fluids had been given over a long period of time by sternal infusion. The skin and subcutaneous tissues over the sternum showed no evidence of irritation or infection. The sternum showed no evidence of osteomyelitis or periostitis. Roentgenograms of the sternum taken twenty-five days after removal of the needle were normal.

All infusions were administered by gravity. The rate of flow could be varied at will, and no difference between intramedullary and intravenous rates of absorption was noted.

In a total of thirty-five transfusions of whole blood, a mild reaction occurred on one occasion only.

The patient's condition gradually improved. The red blood cell count climbed from 1,890,000 to 5,020,000. The stools diminished in frequency and gross blood disappeared. The recovery was interrupted by an exacerbation occasioned by an acute infection of the upper respiratory tract two weeks later. The temporary increase in bleeding required three more blood transfusions, which were given by vein. Convalescence was gradual. No further transfusions were required and the patient's condition had sufficiently improved so that on August 11 he could safely be transferred to a general hospital for definitive care.

TECHNIC

The only special equipment is a standard B-D 15 gage $1\frac{5}{16}$ inch long sternal puncture needle with a stylet. It is inserted in the midline after preliminary anesthetization of the skin and periosteum. With the patient flat on his back, the point of the needle is directed toward his head so that the shaft makes an angle of approximately 30 degrees with the skin. The level of choice may be either the lower portion of the manubrium or the upper portion of the gladiolus. We used both sites. It is to be noted that considerable firm, steady pressure is required to penetrate the anterior plate of the sternum. A sensation of "give" is felt as the point enters the bone marrow cavity. If the needle is inserted correctly, the cortex grips the shaft so firmly that the needle stays in place without further attention. A blood-marrow mixture is now aspirated as a test for proper insertion. The infusion is begun in the same manner as is a venoclysis.

The bevel of the needle should be directed anteriorly so that pressure on the needle will not place it flush against the posterior wall of the marrow cavity and interfere with the infusion. If this should occur, it is easily remedied by slight withdrawal of the needle. The site of puncture is given the same care as that of a Steinmann pin. On completion of an infusion, the stylet is inserted and sterile gauze pads are taped over the needle. When needed for further infusion, the stylet is removed and patency of the needle is tested by aspiration. If necessary to facilitate flow, the needle may be irrigated with a syringe of isotonic solution of sodium chloride.

No complications have been reported, but the original proponents warned against certain accidents due to careless or faulty insertions of the needle, osteomyelitis or subcutaneous infection.[3] It is difficult to see how accidents could occur if a short needle is used carefully and if it is inserted in the midline.

Tocantins [4] has justifiably suggested that hypertonic or irritating solutions should not be used and that this method is contraindicated in cases of bacteremia in which a localized suppurative process might be established after the insertion of the sternal needle.

CONCLUSIONS

In a case of uncontrollable hemorrhage from the bowel in ulcerative colitis, a total of 16,825 cc. of whole citrated blood and 29,250 cc. of fluids was administered by intravenous and intramedullary infusion. A needle was inserted into the sternum and allowed to remain for five days. After an interval of one day it was reinserted and permitted to remain for four additional days. During these periods 9,025 cc. of blood and 13,950 cc. of fluids were successfully given. This method of infusion was found to be simple and safe and may be considered a method of choice when veins are difficult, when a patient should not be permitted to stay on his back for a long time and when a patient is to be transported.

For these reasons we feel that this method should be more widely applied. It is particularly applicable and may prove of inestimable value in the treatment of shock in the field.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE. HOWARD A. CARTER, Secretary.

FIVE YEARS OF PROGRESS IN THE FIELD OF AUDIOMETERS AND HEARING AIDS

Report of the Consultants on Audiometers and Hearing Aids

Five years ago the Council on Physical Therapy appointed a group of consultants to assist it in the consideration of hearing aids and audiometers. The art of manufacturing hearing aids and audiometers had steadily progressed and numerous inquiries were coming to the American Medical Association seeking information about them. The Council felt called on to make available this information. Hence it seemed fitting for the Council to appoint a group of informed men to help it gather information on the industrial and professional phases of these instruments.

AUDIOMETERS

One of the first problems before the consultants was the formulation of requirements for acceptance of audiometers and hearing aids. Since there were no universally adopted standards in existence, considerable study was necessary before pronouncements could be published. To assist the consultants, the manufacturers of hearing aids and audiometers were asked to attend meetings at which the various problems concerning the physical, electrical and acoustical makeup of the instruments were dis-

3. Tocantins, L. M., and O'Neill, J. F.: Infusions of Blood and Other Fluids into the General Circulation Via the Bone Marrow, Surg., Gynec. & Obst. **73**: 281 (Sept.) 1941. Papper and Royeustine.[2]

4. Tocantins, L. M.; O'Neill, J. F., and Jones, H. W.: Infusions of Blood and Other Fluids Via the Bone Marrow, J. A. M. A. **117**: 1229 (Oct. 11) 1941. Tocantins and O'Neill.[2]

cussed. One object the consultants had in mind was to study the problem of making available the best possible instruments at minimum cost.

On Feb. 25, 1939 minimum requirements for acceptable audiometers were published. The consultants have had the cooperation of the Subcommittee on Audiometry of the American Standards Association, and the wording of the Council's requirements agree essentially with those of the American Standards Association. The requirements proved to be of immense importance in standardizing audiometers. On the accepted list at the present time are two pure tone audiometers: the Maico D-5 and the Western Electric Audiometer 6-B. Recently the minimum requirements have been revised and now for the first time the electrical power values for threshold of hearing have been standardized and adopted through the valuable assistance of the National Bureau of Standards.

The consultants realized that a method for estimating the percentage loss of hearing should be established. It was pointed out to the consultants that in the courts of law, insurance companies, compensation boards and so on considerable confusion existed because there was no definite or acceptable method of estimating the percentage loss of acuity of hearing. Hence the consultants with the approval of the Council and the House of Delegates of the American Medical Association proceeded to formulate such a method. Several years' work terminated in the publication of a method, the "Tentative Standard Procedure for Evaluating the Percentage of Hearing Loss in Medicolegal Cases." This method makes use of a threshold audiogram by which to record hearing loss in decibels and from which percentage loss of hearing may be calculated. A reprint describing the method may be had by writing to the Secretary of the Council. Audiogram charts also are available.

Another problem of interest to the profession and especially the otologists and the consultants is the adoption of a nationwide and acceptable method for testing school children. This problem is now being given careful consideration, and the consultants are particularly interested because audiometers are employed. Differences of opinion exist as to which audiometer is the more efficient, the so-called "pure tone" or the phonograph type. Both types have been used and apparently with good results. The Council, advised by the consultants, has accepted the Western Electric Phonograph Audiometer 4-C as an instrument for group testing and a "pure tone" audiometer, the Maico D-8, for screening purposes. Requirements for acceptance of these instruments have not been formulated. The Council considers them on individual merits in accordance with its Official Rules. Phonograph audiometers will test forty pupils at one time, whereas the pure tone audiometer will test only one pupil at a time. Phonograph audiometers are used in the schools only for screening purposes, while pure tone audiometers are designed and used mainly for diagnosis; but recently they have been advocated for screening test purposes and are being adopted in increasing numbers. The consultants are studying the problem further.

HEARING AIDS

On May 11, 1940 "Tentative Minimum Requirements for Acceptable Electric Hearing Aids" were published. These requirements were general in character, the object being to assure physically reliable and efficacious instruments. The Council has, on its accepted list, twenty-three hearing aids. A list of those accepted instruments may be had by writing to the Secretary of the Council.

One of the purposes of the Council on Physical Therapy is to inform the profession and the public relative to the status of apparatus and instruments of a therapeutic or diagnostic nature offered for sale. Instruments and appliances submitted to the Council are considered without charge to the manufacturer and in accordance with the principles laid down in the Council's Official Rules. A product is never "approved" or "recommended" but is "accepted," which means that the Council has found that the instrument meets its rules and requirements, has prepared and published a description, and has included the instrument in its list of accepted devices. When an instrument, for instance a hearing aid, is submitted, the Council asks the manufacturer to furnish one stock instrument as it is supplied to the trade, a description of it, evidence to support the claims made for it in advertising and copies of the current advertising and descriptive literature. The Council does not consider devices unless they are actually on the market. Preliminary samples of the apparatus or experimental models are refused consideration, because the Council is not a developmental or promotional agency. The Council is a judicial body. It reviews investigations and evidence presented by manufacturers of therapeutic equipment and also reviews evidence of investigations which it sponsors. The Council desires physicians and the public to understand that the acceptance of an instrument does not imply a recommendation but means only that the Council has found after due consideration that the proponents of the instrument have conformed to the letter and spirit of the rules.

Exaggerated, misleading and false statements in advertising claims are not permitted in the advertising. The consultants have prepared a list of supplementary rules pertaining to advertising claims for hearing aids which augment the Official Rules. These have been distributed among manufacturers of acceptable instruments. Testimonial advertising is not acceptable to the Council. There are many good reasons for this stand, among which are: (1) Such statements may be purchased; (2) the testifier is seldom if ever informed on problems of the hard of hearing, and (3) the responsibility for statements in testimonials does not rest on the manufacturer and there is no way to fix the responsibility.

A product made in large quantities, e. g., a radio, can be sold at a lower cost per unit than a specialized article, such as a hearing aid, which requires careful workmanship and personalized attention after it is sold. Hearing aids are sold largely by salesmen working on commission. They may or may not have fundamental knowledge of hearing problems or have a great amount of information on the physical principles involved. For the most part they are not trained, aside from a small amount of instruction given by the manufacturer or his representative. The more hearing aids they sell, the more money they make. Hence competition is keen and in some instances unethical. Repeatedly, physicians and wearers of hearing aids mention "high pressure salesmanship" in connection with the marketing of hearing aids. Wearers of hearing aids complain about the high price. Much of the cost to the customer is in the salesman's commission. If commissions were omitted, hearing aids costing $125 to $150 might sell for $50 to $75. One reason for the high cost of hearing aids can be attributed to the aforementioned selling methods. If candidates for hearing aids would purchase them the way spectacles are obtained, hearing aids would be much cheaper.

Manufacturers claim that persons who are hard of hearing resent acquiring an aid, even though having one would make them more efficient in business and give them more pleasure in social intercourse. They say that patients have to be sold; so in one sense of the word the salesman becomes a benefactor and promotes good hearing. For the time being, this method seems to be the only satisfactory way of marketing hearing aids. A physician is unethical who recommends a hearing aid to a patient and demands or receives a commission from the manufacturer or agent. It is unfair to the patient, because he is unaware of the transfer of money, and if the patient knows it he cannot be sure that the advice to buy a hearing aid was for his own good or simply a scheme for the physician to make extra money in addition to the cost of examination and treatment.

Because of competition among salesmen of hearing aids, a patient about to acquire one is literally besieged by salesmen who puff up the values of their own individual instruments. There are claims and counterclaims about superior and inferior qualities of individual aids and about the competitor's product. The patient frequently becomes confused and doesn't know what to believe. This is where the Council and its group of consultants can help the prospective user of an aid by giving reliable information on aids that have been accepted. The Council can influence manufacturers to revise, modify and bring in line with acceptable evidence statements recorded in printed advertising and in descriptive literature. Obviously the Council cannot exercise control over the spoken word of uninformed and overenthusiastic salesmen. The American Society for the Hard of Hearing, its national and local groups, will gladly give advice to the hard of hearing.

At the present time many firms use audiometers (either an acceptable instrument or their own make) to assist them in the fitting of a hearing aid. To an extent, and to a limited extent only, can these instruments help in the fitting of hearing aids. The art of fitting hearing aids has not reached the same perfection as in the fitting of spectacles. Fitting hearing aids is more or less of a "cut and try" procedure, and the audiometer is valuable because it points the way and eliminates much of the guessing and trying. It does not matter whether the audiometer used is standardized or not as long as the salesman knows the characteristics of the instrument.

Employment of an audiometer by a salesman frequently leads to an unpleasant relationship between the otologist and the salesman. A physician's audiogram may record one thing and a salesman's another. There are many reasons why the salesman's audiogram may differ, some of which are: (1) The salesman's instruments are not standardized; (2) the patient may have a cold or some other pathologic conditions not present when the physician made the recordings; (3) the background noise in the room may be much higher, and (4) the salesman may not be qualified. The observational error among experts when making an audiogram may vary as much as 5 decibels from day to day, and insidious comparisons with the physician's audiograms may be made by the salesman.

Glasses have been made and fitted for many years, whereas the electrical hearing aid is a little over 40 years old. Five years ago the vacuum tube instrument was hardly known. Hence, comparing the progress made in the two fields, one finds that enormous strides have been achieved by the manufacturers of hearing aids. On the other hand, greater improvement will have to be made before hearing aids will be as universally worn as spectacles. The physician is aware of this and he knows that many hard of hearing persons soon cast the aids aside because of dissatisfaction of one kind or another. He knows that the patient does not like to be burdened with 12 to 14 ounces of hearing aid equipment, that the instrument may be unbearably noisy at times and that extraneous sounds in the aid are annoying.

There is a general dislike on the part of the hard of hearing for wearing a hearing aid. He may think that it marks him as an old man, although it should not because there are many youths wearing them now. When a man loses his vision he is aware of the defect and makes an effort to correct it. With the hard of hearing it is not always so. His family and friends notice his condition much sooner than he does. Deficiency in vision is perfectly obvious to one who can't see distances or can't see to read small print. Deficiency in hearing comes on him gradually, and usually he is able to get along very well to a certain point except when there are distracting background noises. If he has a 30 decibel loss or less in the voice range of both ears he can get along pretty well at near distances, missing much, but in general carrying on his business and social activities. A person having a 30 to 40 decibel loss in both ears in the speech range should have a hearing aid for any but near speech. He would be benefited, yet he is the one who is most likely to object to wearing an aid. A salesman finding this person will try to sell him an instrument. When he gets it he may or may not like it. Some days his hearing may be better and other days worse. He may wear it for a while, become dissatisfied and then store it in the attic. Battery upkeep costs so much, considering the value obtained from the aid, that he may decide it isn't worth the expense. Hard of hearing persons in the lower income brackets cannot afford to buy batteries. Often the manufacturer of hearing aids blames the physician for not recommending an expense of $125 to $175 when he knows there is a fifty-fifty chance that this particular patient will wear the aid only a short time and then discard it. Rather than lose the confidence of his patient, the physician may prefer to recommend lip reading or treatment that will prevent the acuity of hearing becoming any worse or both. A few salesmen and only the ignorant few accuse physicians of noncooperation, asserting that the physician wants the patient to return and return for treatment because of the fees involved. Ethical physicians will not stoop to such practices. The ethical physican will inform the patient that he can do nothing more to better the hearing, that the patient should study lip reading and that a hearing aid will probably help, if the patient will be content to wear it. Much success has been achieved recently in combining lip reading with the use of a hearing aid. A patient having an average hearing loss of 40 decibels in the speech range in both ears should wear a hearing aid for distances over 3 feet.

Those persons needing a hearing aid are advised to consult a physician who is familiar with instruments that will best help them. A person who uses a hearing device should be advised to safeguard his remaining hearing by keeping in close contact with a qualified otologist.

The manufacturers are to be congratulated on the progress made in this field. They are pulling themselves up by their bootstraps. Research for the most part is financed by the hearing aid companies. Unless they sell hearing aids they cannot improve the instruments. Frequently the model being sold is out of date when compared with the firm's own laboratory model under development. Nearly all manufacturers employ production line methods in one way or another in the manufacturing of the aids.

BATTERIES

Several hundred years ago spectacles were so expensive that only the well to do could afford them. The present day hearing aid falls almost into this category not only because of the initial cost but also because of the upkeep. Batteries cost money. Unbiased persons have reported that battery expense amounts on the average to 3 or 4 dollars a month. Recently the Consultants on Audiometers and Hearing Aids cooperated with the American Standards Association Committee on Dry Cells and Batteries in an effort to standardize the size and terminals of hearing aid batteries. Considerable progress has been made in standardizing A and B batteries for vacuum tube hearing aids, but little was accomplished in standardizing batteries for the older "carbon telephone" type hearing aid. Here there are about as many types of batteries as there are aids. The portable radio has helped in this respect because there is a large demand for radio batteries and in many instances they fit the hearing aid cases and terminals. Special dry cells for hearing aids are so designed that they are more efficient for hearing aid purposes than the flashlight batteries. The flashlight cell is designed for long shelf life, which makes it less efficient for hearing aid purposes. The hearing aid batteries are not designed for a long shelf life but for greater efficiency when used in hearing aids. There are those who have accused the manufacturers of hearing aids and their dealers of carrying on a racket in the battery field by designing batteries that cannot be used in other sets. Manufacturers assert that having special batteries for their sets is a benefit to the industry, since it gives the salesman a source of income to offset his overhead and also enables him to keep in touch with the hearing aid wearer, providing better battery and repair service for the hearing aid itself. Be that as it may, wearers of hearing aids still complain about the high cost of batteries. It is the opinion of the consultants that one or two sizes of hearing aid batteries with common terminals that would fit all makes of instruments would lower the battery expense and open the way for the hard of hearing to take greater advantage of the modern hearing aid.

ACKNOWLEDGMENTS

The Council regrets its recent loss by death of two of its most prominent consultants, Drs. C. C. Bunch and W. P. Wherry, who died within twenty-four hours of each other. During their tenure of office they contributed greatly to the success of the consultants, and the Council will miss them. It is also fitting to pay honor to a man who first conceived the idea of forming a group of consultants on audiometers and hearing aids to assist the Council in this work, namely Dr. Austin Hayden, who died in July 1940. The Council wishes to express its appreciation to the consultants for their untiring efforts in assisting it with the consideration of these instruments and helping to solve the problems confronting the hard of hearing. They contribute their services gratuitously and devote many hours each month reviewing evidence, scrutinizing claims in large quantities of advertising matter, and investigating and testing instruments. The present membership of the group is as follows: Dr. W. E. Grove, chairman, Drs. George M. Coates, E. P. Fowler, Walter Hughson, Isaac Jones, Dean Lierle, Douglas Macfarlan, C. Stewart Nash, Horace Newhart, Paul Sabine and Burt Shurly.

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SATURDAY, DECEMBER 12, 1942

"IMMERSION FOOT"

"Immersion foot" is a term applied to a condition produced by long immersion of the feet in cold water, usually associated with immobility of the limbs and constriction by boots or other clothing. An exactly similar condition was described by Ungley[1] as it affected the ungloved hand of an airman who had lain exposed for twenty-four hours on a snow covered mountain. He believes that the term "immersion foot" is inaccurate as well as inadequate. The ideal term should be applicable to other tissues as well as to the feet and should express both the causative factors, namely cold and the neural and vascular disturbances which result from cold. He uses the term "peripheral vasoneuropathy after chilling." The condition has become an extremely pressing problem because of its frequency among those who have been adrift in boats or rafts after torpedoing at sea.

Ungley bases his conclusion on the study of some 80 cases seen in Scotland in the last two and one-half years. During exposure, which lasted for periods up to fourteen days, the immersed limbs soon became numb, the hands became clumsy and some patients described walking "as if on cotton wool." Pain, tingling and even itching were unusual; cramps sometimes occurred, usually in the calves. Swelling of bare feet was noticed after some hours or days. The skin, red at first, was later pale, "sickly yellow," mottled, blue or black; at sea-freezing temperatures, it might remain vivid red. He describes three stages after rescue. The prehyperemic stage lasts for a few hours to several days. The extremities remain cold, somewhat swollen, discolored and numb, with fairly extensive "glove or sock" anesthesia. Peripheral arteries may be pulseless for some hours and remain so in cases going on to gangrene. A hyperemic stage follows and may last from six to ten weeks. Typical observations in this stage include vascular disturbances of the skin involving temperature differentials; increase in swelling, especially if the extremities have been warmed; sensory disturbances such as tingling, usually of "glove or sock" distribution; motor disturbances; absence of sweating, and blisters, ulcers and gangrene. The post-hyperemic stage lasts for weeks or months after the hyperemia has subsided. Except for fresh blisters or infections, the extremities are no longer unduly hot in a normal environment. Indeed, for months or years after rescue there may be a cold-sensitive state, giving rise to the Raynaud phenomenon or to coldness which may last for hours after return from a cold to a warm environment.

In a parallel study made recently by three Royal Canadian medical officers,[2] observations were reported on 142 cases of "immersion foot," almost all of them the result of enemy action in the North Atlantic. The patients had been in life boats or on rafts for periods varying from thirty hours to twenty-two days, the boats almost always containing water to a depth of several inches. At the time of removal of the patients from the open boats or rafts the feet were cold, swollen and waxy white, with scattered cyanotic areas. The patients complained at that time that their feet felt heavy, "woody" and numb, and the feet were anesthetic to pain, touch and temperature. Shortly after the removal of the feet from this traumatizing environment the swelling increased rapidly as the feet became red, hyperemic and hot without sweating, and the pulse in the vessels of the feet was full and bounding. This was followed in about ten days by intense neuritic pains and, in severe cases, by varying degrees of gangrene. Return of sensation and complete motor control may be delayed for many weeks, and pain may recur on exposure to cold and wet.

Ungley maintains that the essential cause of these disturbances is exposure of the limbs to cold insufficient to freeze the tissues. Immersion, he says, has no specific action apart from its effect in keeping the parts cold. Webster and his colleagues,[2] however, state that the only recorded temperatures of the water showed it to be from 34 to 36 F., and, as the freezing point of sea water is approximately 28.5 F., the feet may very well have been exposed to surface cooling below the freezing point of blood, which is 31 F. Nevertheless, they say, since the condition may occur to those exposed for long periods in subtropical waters, it cannot be classed as a true frostbite. Judging from the patients' history, Ungley says, the following factors influence the occurrence and severity of this condition: time of exposure and temperature of water; footwear (this affords some protection for short exposure, but, because of constriction, is harmful for long exposure, causing swelling of the feet and impairment of circulation); immobility, since men who kept moving suffered less than those who sat still; body cooling, as from wind, total immersion, repeated soakings or inadequate cloth-

1. Ungley, C. C., and Blackwood, William: Peripheral Vasoneuropathy After Chilling—"Immersion Foot and Immersion Hand," Lancet 2:447 (Oct. 17) 1942.

2. Webster, D. R.; Woolhouse, F. M., and Johnston, J. L.: Immersion Foot, J. Bone & Joint Surg. 24:785 (Oct.) 1942.

ing, which reduces the peripheral circulation; seasickness and starvation may be contributory agents; age—men over 40 and youths under 17 died from cold sooner than those of intermediate ages; morale—those who give up hope die more quickly or suffer more severely than their companions when treated after rescue. Colored races are said to be more prone to "trench foot" than northern races, but in this study Arabs fared no worse than Europeans.

The recommendations for prophylaxis and treatment of the two groups are similar. First aid and hospitalization should be directed to avoidance of trauma, slow warming of affected limbs, strict asepsis and adequate supportive treatment. For prophylaxis the investigators suggest that boots and any constricting footwear, if wet, should be removed and oil or heavy grease should be generously applied to the feet while the seaman is exposed. On rescue the patients should be lifted, if possible, and not permitted to walk. Massage should not be attempted. The feet should be exposed and elevated, and the patient given supportive treatment. Dry refrigeration, they say, appears to be successful in reducing tissue loss to a minimum. In the hospitals strict asepsis should be maintained, and the feet should be cooled, if possible, during the hyperemic period.

WAR CASUALTIES AT PEARL HARBOR

The *Hawaii Medical Journal* in the September-October issue publishes a symposium on the disposition of war casualties of Dec. 7, 1941 at Pearl Harbor. The authors and discussers were chosen from among those present and active on December 7, so that only first hand experiences are reported. Lieutenant Colonel Spittler,[1] in his discussion of the treatment of war wounds, stressed two principles, namely thorough débridement and subsequent open treatment. It was his impression that the local use of a sulfonamide powder combined with the oral, intravenous or subcutaneous administration had much to do with the reduction in the incidence of infection in wounds. Gas gangrene was combated by secondary débridement, a sulfonamide locally and generally, and x-ray irradiation. Commander Downes thought that the role of the sulfonamides in securing the amazing results was probably exaggerated. Many other favorable factors existed. The patients were a selected group of healthy young men in excellent condition and exceedingly well nourished. This being Sunday morning, they were clean, rested and not exhausted. In addition, the cases were treated by extremely competent and well trained surgeons. In his own experience 110 casualties were treated at Mobile Hospital No. 2. A sulfonamide was used in only 1 case, and in this case infection occurred. It was the only infection that developed in the whole group.

1. Spittler, A. W.: War Wounds, Hawaii M. J. 2: 17 (Sept.-Oct.) 1942.

In the treatment of shock, as outlined by Lieutenant Colonel Young,[2] modern concepts of shock and shock therapy were successfully applied. These consisted of early treatment, even in the absence of clinical signs of shock, by means of transfusions of plasma, crystalloids, isotonic solution of sodium chloride, isotonic solution of three chlorides or Locke's solution intravenously, oxygen as needed, judicious use of sedation and administration of adrenal cortex extract. The highest mortality rate came from abdominal wounds. However, about 50 per cent of these patients for whom operation was possible survived. The improvement in the rate of survival, as compared to the injuries to the gastrointestinal tract in the first world war, was probably due to the liberal employment of the sulfonamides intraperitoneally and orally. Lieutenant Colonel Heaton,[3] in discussing the operative procedures in these cases, expressed his preference for open drop ether as the anesthesia of choice for abdominal cases. Adequate blood levels of sulfanilamide during the first twenty-four hours were maintained by absorption of the drug implanted in the peritoneal cavity at the time of operation. Chemotherapy was continued for the next several days by oral or intravenous administration. J. E. Strode,[4] in the discussion of chest wounds, emphasized the importance of the first aid treatment of the sucking wounds of the chest. The hole is to be plugged immediately by almost any method at hand. The hemorrhage from the intercostal or internal mammary arteries is controlled by ligation or compression. One must be on the lookout for tension pneumothorax. This is readily relieved by aspiration, with use of a water sealed catheter if necessary. Débridement of the wound is just as essential here as elsewhere. Foreign bodies, blood clots and débris should be sucked out of the pleural cavity and from 8 to 10 Gm. of powdered sulfanilamide dusted into the pleural cavity and into the wound itself, after which the chest wall is to be closed tightly, if possible. Dr. Cloward[5] outlined a rather conservative therapy for head injuries. He points out that in many large series of cases it has been demonstrated that only about 5 per cent show increased intracranial pressure, so that any therapeutic measure directed to relieve intracranial pressure, when it is actually not present, will not only not do any good but may even do harm by interfering with the physiologic processes of the injured cells. Morphine or other narcotics should never be given to a patient with a head injury. Increased intracranial pressure is to be treated by lumbar puncture and by 50 per cent dextrose in 100 cc. doses given intravenously—this to be done only after trephining over the area of suspected hemorrhage. Orthopedic problems are somewhat dif-

2. Young, C. T.: Shock, ibid., p. 22.
3. Heaton, L. D.: Abdominal War Wounds, ibid., p. 26.
4. Strode, J. E.: Chest Wounds, ibid., p. 29.
5. Cloward, R. B.: Head Injuries, ibid., p. 32.

ferent in emergency conditions from those of civil practice because of the frequent necessity of transferring patients to the mainland. This makes the use of cumbersome apparatus undesirable. For these reasons Lieutenant Macpherson [6] states that traction in his service was discarded in favor of open operation with plating or reduction of the fracture with two or more pins incorporated in the cast. Extensive lacerated wounds of the extremities and compound fractures were placed in plaster casts as soon as possible, since plaster of paris has decided advantages over any other treatment in these cases. The principles advocated by Winnett Orr and tested in the Spanish Civil War were again found to be sound. Sulfanilamide proved of great value in these compound fractures. Lieutenant Colonel Robertson had the opportunity of seeing these patients later in a mainland hospital to which they were evacuated. The general and local condition of the men on arrival was excellent. Prompt and skilful treatment and the use of sulfonamides were credited with the results. Lieutenant Commander Spangler [7] points out that in burns it is important to treat the patient first for pain, anxiety and beginning shock. In the treatment of lesions, attempt is made to convert a soiled wound into a clean, aseptic wound. The burned area is washed with soap and water, debrided and sprayed with freshly prepared 10 per cent tannic acid solution, followed ten or fifteen minutes later by swabbing with 10 per cent silver nitrate solution. No dressings were applied. The involved area was kept under a warm air cradle with a maximum temperature of 85 F. For hands, feet, face and genitals 1 per cent sulfanilamide and petrolatum was used. Spangler expresses the opinion that this is perhaps the most satisfactory way of handling a large group of burns. Lieutenant Commander Palma [8] described the syndrome of blast injury of the lungs and of the abdomen. The clinical picture was similar to that described by the British observers. He advises that in all war casualties, regardless of the type of injury produced, if there has been exposure to the detonation of high explosives, the integrity of the chest should be ascertained by x-ray examination, because general anesthesia is contraindicated when there is blast injury of the lungs. Oxygen is life saving and should be administered continuously by tent or the B. L. B. mask. The so-called immersion blast occurs in the water and presents features of shock and of abdominal symptoms.

It is gratifying, indeed, to learn that the Army, the Navy and civilian medical personnel proved equal to the great emergency and delivered a service of the most advanced type. The symposium will undoubtedly exert a definite influence on the further progress of therapy of war casualties.

6. Macpherson, J. D.: Orthopedic Wounds, ibid., p. 37.
7. Spangler, P. C.: Burns: A Treatment Plan for Large Numbers, ibid., p. 40.
8. Palma, Joseph: Blast Injury of the Lungs, ibid., p. 42.

CRYSTALLIZED POLIOMYELITIS VIRUS

Crystallization of a protein from brains of mice infected with poliomyelitis that has all the infectious properties of poliomyelitis virus has just been reported by Racker [1] of the Department of Physiology, University of Minnesota. Twelve years ago Clark and his co-workers [2] of the University of Wisconsin reported evidence that the virus of poliomyelitis is found largely in the water soluble globulin fraction of brain-cord suspension infected with poliomyelitis. They showed [3] that the virus is not precipitated to any appreciable degree by one-third saturation with ammonium sulfate. Half saturation, however, precipitates it almost quantitatively. Somewhat later Howitt,[4] Clifton [5] and others found that lipoids can be extracted from infected brain suspensions by means of ether without appreciable decrease in the original infectious titer. After prolonged freezing, Loring and Schwerdt [6] of Stanford University afterward isolated a noncrystalline macromolecular infectious protein from medulla-cord suspensions infected with poliomyelitis by means of high speed differential centrifugation. The slow autolysis during prolonged storage at — 10 C. apparently increased the purity of their end product.

Racker's crystallization method is essentially a combination of the technics of these three previous investigators. Mouse brains infected with poliomyelitis were frozen by Loring's method and packed in solidified carbon dioxide. Some weeks later groups of from 10 to 15 refrigerated brains were thawed and emulsified in 10 volumes of saline solution (p_H 7.8). After prolonged centrifugation the resulting clear supernatant fluid was extracted with an equal volume of ether by the Howitt-Clifton technic. The lipoid free fluid thus obtained was adjusted to p_H 4.0 by the addition of dilute acetic acid and the resulting precipitate discarded. The resultant clear supernatant fluid was first precipitated with 1.6 molar ammonium sulfate and the precipitate discarded. The supernatant fluid was then reprecipitated with 2.3 molar ammonium sulfate at p_H 5.6 and the secondary precipitate saved. This precipitate was suspended in isotonic solution of sodium chloride, dialysed for three days in a cellophane tube against isotonic solution of sodium chloride and then brought to p_H 4.3 by the addition of tenth normal acetic acid. The undissolved residue was discarded. To the resultant clear supernatant fluid hundredth normal acetic acid was added slowly, drop by drop, until a first precipitate appeared. This precipitate was found under a polarizing microscope to consist largely of crystalline (birefringent) material. X-ray diffraction photographs gave halo effects characteristic of proteins.

1. Racker, E.: Science **96**: 364 (Oct. 16) 1942.
2. Clark, P. F.; Schindler, J., and Roberts, P. J.: J. Bact. **20**: 213 (Sept.) 1930.
3. Clark, P. F.; Rasmussen, A. F., Jr., and White, W. C.: J. Bact. **42**: 63 (July) 1941.
4. Howitt, B.: Proc. Soc. Exper. Biol. & Med. **28**: 158, 1930.
5. Clifton, C. E.; Schultz, E. W., and Gebhardt, L. P.: J. Bact. **22**: 7 (July) 1931.
6. Loring, H. S., and Schwerdt, C. E.: J. Exper. Med. **75**: 395 (April) 1942.

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A few of these protein crystals were thoroughly washed in thousandth normal acetic acid and then dissolved in dilute sodium hydroxide. On intracerebral inoculation into mice the resulting solution produced typical paralytic symptoms of poliomyelitis after an incubation period of fourteen to seventy-two hours. Racker, however, stresses the fact that this is not proof that the crystalline material represents pure poliomyelitis virus. The possibility that the virus may be merely adsorbed on a protein carrier cannot be eliminated. Recrystallization and higher purification of the infectious protein have not yet been reported.

Racker's cautious attitude is reminiscent of the general interpretation of the earlier alleged crystals of plant viruses. These have been repeatedly recrystallized and are now quite generally believed to be pure virus crystals. So conceived the plant virus becomes an autocatalytic protein increasing in size and depolymerizing at the expense of the infected plant cell. Or the plant virus may be pictured as an ingrafted alien or perverted plant protein multiplied by the plant cell. Racker's results suggest an eventual similar interpretation for the poliomyelitis virus.

Current Comment

LIVER BILE SLEEPS ON

For years "Carter's Little Liver Pills" has been advertised to the public with such claims as the following: "WAKE UP YOUR LIVER BILE—Without Calomel—And You'll Jump Out of Bed in the Morning Rarin' to Go. The liver should pour 2 pints of bile juice into your bowels every day. . . . It takes those good, old Carter's Little Liver Pills to get these 2 pints of bile flowing freely to make you feel 'up and up.'" Now Ivy, Roback and Stein [1] report a series of experiments on dogs with the drugs concerned and they conclude that two pills given intravenously or two, four and six pills intraduodenally "exert no cholecystokinetic and choleretic effect." The authors continue "That is, they do not cause the gallbladder to contract or stimulate the formation of bile by the liver under conditions which permit the gallbladder and the liver to be stimulated by the hormones which are normally concerned in causing the gallbladder to contract and the liver to secrete." These experiments were carefully conducted, well controlled and meticulously reported; the evidence supporting the authors' conclusions seems to be quite adequate. The active ingredients involved in Carter's Little Liver Pills consist of ¼ grain of aloes and $^{6}/_{1,000}$ grain of podophyllum per pill. Now that this evidence regarding the lack of the specific value claimed for these ingredients is available, the Food and Drug Administration may concern itself with claims made in or on the package, and the Federal Trade Commission may give due attention to newspaper and magazine advertisements which either state definitely or imply that these pills have a cholerectic and cholecystokinetic action. Not many nostrums have been carefully studied by scientists. Many such nostrums require little, if any, study to determine that the claims made for them are false or misleading. The Food and Drug Administration, the Federal Trade Commission and the Post Office Department have accomplished much in the protection of the public against the blandishments of the nostrum promoters. In this case science assumes an active role in such protection by developing scientific data concerning a specific product to refute the promoter's unwarranted claims.

1. Ivy, A. C.; Roback, R. A., and Stein, I. F., Jr.: Do the Ingredients of Carter's Little Liver Pills Cause the Gallbladder to Contract and Stimulate the Flow of Bile by the Liver? Quart. Bull. Northwestern Univ. M. School **16**: 299 (Winter Quarter) 1942.

YOLK SAC PROPAGATION OF MAMMALIAN CANCERS

Taylor and his co-workers [1] of the Biochemical Institute, University of Texas, have developed an improved technic for propagating mammalian cancers in the yolk sac of chick embryos. Mammalian carcinomas can be grown on the chorioallantoic membrane of the developing chick.[2] This technic has proved to be unsatisfactory because of the relatively low percentage of takes and the relatively high egg mortality (65 per cent).[3] To obviate these difficulties Taylor injected suspensions of mouse carcinoma tissue by means of a hypodermic needle directly into the yolk sac of four to five day incubated eggs. The mortality rate was practically nil; there were 100 per cent takes by this technic. Twelve to thirteen days later, tumors up to 3.5 Gm. in size were obtained after yolk sac inoculation of as little as 0.05 Gm. of cancer tissue. The injected material had evidently become attached to the inner wall of the yolk sac, from which it obtained adequate blood supply. In this position there was ample room for massive growth without mechanical interference with the embryo membranes. Tumor masses removed from the yolk wall grew readily when transplanted back into mice. Free cancer cells were apparently diffused throughout the yolk material, since subdermal injections of apparently pure yolk substance from cancer inoculated eggs produced typical tumors in mice. For many problems in cancer research the new method of growing cancer cells in egg yolks should be of value.

1. Taylor, Alfred; Thacker, J., and Pennington, D.: Science **96**: 342 (Oct. 9) 1942.
2. Murphy, J. B.: Transplantability of Malignant Tumors to the Embryos of a Foreign Species, J. A. M. A. **59**: 874 (Sept. 14) 1912.
3. Stevenson, H. N.: J. Cancer Research **2**: 63. 1917.

MOUNT SINAI, NEW YORK, AND BERNARD SACHS

The ninetieth year of operation of the Mount Sinai Hospital of New York is signalized by a special issue of its journal [1] dedicated to Dr. Bernard Sachs. Both the name of the hospital and that of the physician have long been associated with the best in American medicine. This special issue contains nearly seventy contributions on original and historical subjects. The contributors include the names of many leaders in the profession, who for the most part have been associates or students of Dr. Sachs. Certainly this special issue of the *Journal of Mount Sinai Hospital* is a most appropriate and well merited tribute.

1. J. Mount Sinai Hosp. **9**, November-December 1942.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

INTERNS AND RESIDENTS FOR 1943-1944

According to the Procurement and Assignment Service, Washington, D. C., the expansion of the Army and Navy in 1943 and 1944 will demand the services of such large numbers of young physicians that a critical appraisal of all positions held by interns and residents and fellows is necessary.

Interns.—Graduates of medical schools who hold commissions in the Army or the Navy will be allowed twelve months' deferment of active duty for the completion of an internship. This makes it necessary that internships begin immediately on graduation. Medical school graduates who are deferred by Selective Service may, under the Selective Service regulations, have their deferments continued through one year of internship. Medical school graduates who on account of sex, physical defects or other causes are not subject to induction or likely to be reclassified by Selective Service are not officially restricted as to the length of internships which they may serve but they too have a responsibility to make themselves available as early as possible for civilian services which contribute to the war effort.

Residents and Fellows.—Interns who have already served a year of internship must be considered as residents for the duration of the war. Although the Army and Navy appreciate the importance of graduate training in the various specialties of medical practice, they do not feel that they can at the present time defer calling interns to active duty in order that they may continue specialized training in civilian hospitals. Therefore, the only justification for the continuation of residencies and fellowships during the war is that they are essential for the provision of adequate medical care for the hospital patients or for the clinical training of medical students. In view of this situation, there are several principles that must be followed in the selection of residents or clinical fellows for 1943.

First, the minimum number of residencies with which each hospital can function must be determined. For 1942 the Directing Board of the Procurement and Assignment Service stated that in general this number should be less than 50 per cent of the number of residents that these hospitals had before the war. For 1943 this number must be reduced still more.

Second, having determined the minimum number of residents that are essential, these should be selected from the following groups in order:

1. Physicians who for physical or other reasons cannot qualify for service with the Army or the Navy.

2. Present interns or residents who are deferred by Selective Service. Preference in this group should be given to those who have been deferred in class IV-F and class III-A or III-B and maintain a bona fide family relationship with wife and/or children.

3. Present interns who hold commissions in the Army or Navy. No requests for deferment of individuals in this group should be made until the possibilities of filling minimum essential residencies from individuals in groups 1 and 2 have been exhausted. It is impossible at the present time to give assurance that interns who hold commissions will be deferred. The Surgeon General of the Army and the Surgeon General of the Navy have assured the Procurement and Assignment Service of all possible cooperation in meeting this situation. On the other hand, the urgent needs for medical officers in this age group and the necessity of securing the authorization of the War and Navy departments to hold men with commissions in an inactive status beyond one year of internship make it imperative that hospitals make every possible effort to fill essential residencies and fellowships without depending on interns who hold commissions or those who might be subject to induction by Selective Service.

In case it becomes necessary to request deferment of active duty for any individuals in this group, such requests should be submitted to the state committee of the Procurement and Assignment Service.

Approval of these requests must further be concurred in by the chairman of the Corps Area Committee and the representatives of the hospital and medical education committees.

ARMY

PERCY JONES GENERAL HOSPITAL

As previously announced, the government has purchased the Battle Creek Sanitarium, Battle Creek, Mich., consisting of several buildings, utility facilities, including power plant, water pumping station and electrical generating units, along with 28 acres of ground. Funds have been made available to the extent of about $1,000,000 for conversion, which probably will be completed by December 15 and the hospital opened for patients about January 1. The hospital will have a capacity of 1,550 beds. Facilities for surgery, genitourinary clinic, central supply room, clinical laboratory and dental clinic were built on the sixth floor of the old building. The physical therapy department will be on the same floor level in the first floor of the former men's bath building. A chapel is being built on the mezzanine floor of the new fourteen story building and a pipe organ, the gift of Mr. W. K. Kellogg, is being installed there.

Nine floors of the fourteen story building are being converted into wards, and the eleventh, twelfth and thirteenth floors are being prepared for housing commissioned and nurse personnel. Contracts have been let for the building of one bachelor officers' barrack, three nurses' barracks and five barracks for enlisted men. Barracks for two hundred enlisted men have been com-

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pleted and occupied after remodeling the former nurses' home on the reservation. The staff will consist of some eighty to one hundred officers, one hundred and twenty to one hundred and sixty nurses, physical therapy and occupational therapy aides, dietitians and some six hundred enlisted men. The hospital was named after the late Col. Percy L. Jones, M. C., who entered the service during the Spanish-American War as a captain in the Tennessee Volunteers.

Col. Norman T. Kirk, M. C., is commanding officer, Lieut. Col. Robert H. Kennedy of New York is chief of the surgical service, Lieut. Col. Walter B. Martin of Norfolk, Va., is chief of the medical service and Lieut. Col. Ingolf B. Hauge, D. C., U. S. Army, chief of the dental service. The professional personnel is practically complete and ready to function as soon as the conversion is completed.

EIGHT NEW YORK CITY HOSPITAL UNITS ON ACTIVE DUTY

Eight of the eleven United States Army Hospital units organized in compliance with the Surgeon General's directions and completely staffed by as many different New York hospitals had already been ordered to active duty, according to the New York *Times* of November 22. The eight hospital units on active duty are:

Army General Hospital No. 2 (Presbyterian Hospital Unit).
Army General Hospital No. 3 (Mount Sinai Hospital Unit).
Army General Hospital No. 9 (New York Hospital Unit).
Army General Hospital No. 79 (Long Island Hospital and Medical College Unit).
Army Evacuation Hospital No. 2. (St. Luke's Hospital Unit).
Army Evacuation Hospital No. 7 (Postgraduate Hospital Unit).
Army Evacuation Hospital No. 9 (Roosevelt Hospital Unit).
Army Evacuation Hospital No. 12 (Lennox Hill Hospital Unit).

Of the eleven hospital units, the remaining three not yet on active duty are Army General Hospital No. 1 (Bellevue Hospital Unit), Army General Hospital No. 37 (King's County Hospital Unit) and Army Evacuation Hospital No. 14 (City Hospital Unit).

This information was made public, according to William S. Paley, chairman of the campaign, as evidence of the service rendered to the nation as well as to the community by those who have supported the seventy-six voluntary nonprofit hospitals of the city which participate in the United Hospital Fund.

COLORADO HOSPITAL UNIT ACTIVATED

The 29th U. S. Army General Hospital has been activated as a unit at Fort George G. Meade, Maryland, and was expected to be ordered to foreign service in a short time. The medical, dental and administrative officers, nurses, dietitians, physical therapy aide and chaplain were procured and initially trained under the sponsorship of the University of Colorado School of Medicine and Hospitals, Denver. The medical officers received preliminary training at the U. S. Army Fitzsimmons General Hospital, Denver. The nurses, physical therapy aide, dietitians and surgical workers were activated at Camp Carson, Colorado Springs, and then were to be transferred to Fort Meade as quarters became available. The Surgeon General appointed as commanding officer of the unit Col. W. C. Pollock, M. C., U. S. Army, and assigned nine other administrative officers and five hundred enlisted men to complete the command. The hospital will have a capacity of 1,000 beds, which, if necessary, can be expanded to twice that number. The medical and dental officers and other personnel assigned to this unit as of September 15 are as follows:

Administrative Service

Commanding officer, Col. William C. Pollock, M. C.
Executive officer, Major Henry J. Dillon, M. C.
Adjutant, 1st Lieut. Arlice J. Moore, M. A. C.
Personnel officer, 1st Lieut. G. Arnold Logan, M. A. C.
Receiving and evacuation officer, Capt. John D. Gillaspie, M. C.
Medical supply officer, Capt. John F. Latcham, M. A. C.
Registrar, 1st Lieut. Keith D. Heuser, M. C.
Commanding officer, medical detachment, 1st Lieut. Fred Dempsey, M. A. C.
Chaplains: 1st Lieut. James B. Roe, Chap. C. (Prot.); 1st Lieut Francis L. Hickey, Chap. C. (Cath.).
Assistant personnel officer, 2nd Lieut. Bert W. Chiappini, M. A. C.
Assistant commanding officer, medical detachment, 2nd Lieut. Maurice P. Rees, M. A. C.
Two Q. M. C. supply and utilities and one mess officers are yet to be assigned.

Professional Service

Chief of medical service, Lieut. Col. Edward G. Billings, M. C.
Assistant chief, medical service, Major Robert S. Liggett, M. C.
Medical service section chiefs: gastroenterology, Capt. Frank B. McGlone, M. C.; neuropsychiatric, Major Howard P. Gilbert, M. C.; general medical, Major Robert T. Terry, M. C.; cardiovascular, Major Robert W. Gordon, M. C.; communicable diseases, Major Gerald M. Frumess, M. C.
Medical service ward officers: Capt. Lawrence D. Buchanan, M. C.; Capt. Joseph D. Friedland, M. C.; Capt. Paul Haun, M. C.; Capt. Leo W. Lloyd, M. C.; Capt. Paul D. Garvin, M. C.; Capt. Carl F. Arndt, M. C.; 1st Lieut. Paul M. Clark, M. C.; 1st Lieut. William W. Abrams, M. C.; 1st Lieut. Frank Princi, M. C.
Chief of surgical service, Lieut. Col. John M. Foster Jr., M. C.
Assistant chief, surgical service, Major Frederick R. Harper, M. C.
Surgical service section chiefs: orthopedic, Major Foster M. Matchett, M. C.; urologic, was assigned to Capt. Robert M. Hall, M. C. (absent as noted); eye, ear, nose and throat, Major Ivan W. Philpott, M. C.; septic surgery, Major Kenneth C. Sawyer, M. C.; general surgery, Major Edgar W. Barber, M. C.; Major Jack D. Bartholomew, M. C.
Anesthetist, Capt. Hermann B. Stein, M. C.
Surgical ward officers: Capt. James D. Morrison, M. C. (ophthalmologist); Capt. James Chessen, M. C. (ear, nose and throat); Capt. Charles G. Freed (neurosurgeon); Capt. Roy C. Rounds, M. C. (orthopedist); Capt. Irvin E. Hendryson (orthopedist, absent); Capt. Chauncey A. Hager, M. C.; 1st Lieut. Karl F. Sunderland, M. C.; 1st Lieut Harold R. McKeen Jr., M. C.; 1st Lieut. James S. Haley, M. C.; 1st Lieut. John C. Straub, M. C.
Chief of dental service, Major Arnold H. Miller, D. C.
Dental service, oral surgeons: Capt. Robert M. McDowell, D. C.; Capt. Andrew P. Scott, D. C.; prosthetist, Capt. Gordon W. Murray, D. C.
Dental service, general operators: 1st Lieut. Raymond W. Weaver, D. C.; 1st Lieut. Franklin S. Garrison, D. C.; 1st Lieut. Carryl M. Becker, D. C.
Chief of laboratory service, Major Rodney H. Jones, M. C.
Laboratory service staff: Capt. Alexis E. Lubchenco, M. C.; 1st Lieut. Alfred S. Blauw, M. C.
Chief of x-ray service, Major James W. McMullen, M. C.
Assistant x-ray service, Capt. Christopher H. Martin, M. C.
Principal chief nurse, 1st Lieut. Mary Frances Frieden, A. N. C.

Civilian Employees

Dietitians: Miss Doris Odle (head dietitian), Miss Emma J. Hollett, Miss Fern A. Stone.
Physical therapy aide (head), Miss Florence E. Bullock.
Social service worker, Miss Theresa Harder.

TECHNICAL MEDICAL TRAINING COURSES

The War Department announced on November 27 that special courses in technical medical training for several thousand enlisted men would begin at nine of the army medical centers, December 1. These men will be schooled in the technical phases of medicine, dentistry, pharmacy, surgery, veterinary medicine, roentgenism and laboratory work and will be chosen at medical replacement training centers and other echelons. The students will be furnished from the nine service commands in the United States, medical replacement training centers, units of the ground forces and air forces. The minimum educational requirements for selection will be high school graduation or its equivalent for laboratory, pharmacy, dental and roentgenologic technicians and common school graduation for medical, surgical, veterinary and sanitary technicians. Continuing courses are also to be offered. The locations of the schools are as follows:

Army Medical Center, Washington, D. C.
Lawson General Hospital, Atlanta, Ga.
Billings General Hospital, Fort Benjamin Harrison, Indiana.
O'Reilly General Hospital, Springfield, Mo.
Fitzsimons General Hospital, Denver.
Army and Navy General Hospital, Hot Springs National Park, Ark.
Brooke General Hospital, Fort Sam Houston, Texas.
William Beaumont General Hospital, El Paso, Texas.
Letterman General Hospital, Presidio of San Francisco.

MORE ADMINISTRATIVE OFFICERS

Graduation exercises were held for the members of another class in the Medical Replacement Training Center's Officer Candidate School, Camp Barkeley, Texas, November 25, all of whom became second lieutenants in the Medical Administrative Corps. The diplomas were presented by Brig. Gen. Roy C. Heflebower, school commandant. The oath of office was administered by Lieut. Col. Charles L. Driscoll, M. A. C., school executive. Col. George E. Armstrong, M. C., assistant commandant and school director, presided during the ceremonies.

FLIGHT SURGEONS' ASSISTANTS

A class of seventy-four flight surgeons' assistants completed the six weeks course in aviation medicine at the School of Aviation Medicine, Randolph Field, Texas, November 21. Col. Eugen G. Reinartz, M. C., commandant of the school, delivered an address. The certificates were presented by Major Emerson M. F. Weaver, M. C.

CIVILIAN DEFENSE

REVISED INSTRUCTIONS FOR FIELD CASUALTY AND AMBULANCE UNITS OF EMERGENCY MEDICAL SERVICE

The Office of Civilian Defense, Washington, D. C., on November 13 issued Circular Medical Series No. 23, which follows:

Because of the diminishing supply of civilian physicians and nurses and the growing necessity to conserve manpower, the following economies in the organization and operation of field units of the Emergency Medical Service are to be recommended to all state and local chiefs of Emergency Medical Service for adoption:

1. *Mobile Medical Teams.*—Emergency medical field units are to be composed of mobile medical teams and no longer of squads or groups of teams. Each mobile medical team is to consist, as heretofore, of one physician, one nurse and two auxiliaries.

2. *Express Parties.*—Immediately on receiving an air raid warden's report of a bombing incident with casualties, the control center will dispatch only one express party to each major incident. An express party will consist of one rescue team, one mobile medical team, one ambulance and perhaps one passenger car or station wagon.

3. *Reserves.*—Such an express party will usually be sufficient to handle a major incident or a group of neighboring minor incidents with casualties. Additional medical and rescue personnel, ambulances and passenger cars for sitting cases should be held in reserve and should be dispatched by the control center only on subsequent request of the incident physician (head of the mobile medical team) or of the incident officer at the scene.

4. *Reduction in Movement and Use of Medical Personnel.*—Mass air raids have occurred chiefly, although not exclusively, at night; both night and day raids are now usually sudden and intense. As protection against a sudden and unexpected attack by the enemy, every hospital having interns or residents is urged to have at least one or more mobile medical teams constantly on call to be ready to respond promptly to the order of the control center. Most alarms are not followed by an enemy attack; the availability of a few mobile teams at each hospital will make it unnecessary in most cities to disturb the depleted and overworked medical profession by requiring them to mobilize at casualty stations throughout the city on every alert. Moreover, the first line mobile medical teams of hospitals also need not be disturbed until medical service is needed at an incident where casualties have been reported. Practicing physicians of the neighborhood should be mobilized to relieve the primary mobile team when there is a continuing need for field services at the incident or when multiple or large incidents make it desirable to activate a casualty station for the care of the slightly injured. Conservation of medical personnel in this manner will, from now on, become increasingly important.

5. *Reduction in Number of Casualty Stations.*—Conservation of emergency medical service personnel can also be accomplished by reducing the number of casualty stations which must be equipped and staffed. British experience over three years indicates that most cities do not require more than one casualty station for each twenty-five thousand persons and that they need not be nearer than a mile apart. Casualty stations for the temporary care of minor casualties are required at or near every hospital. They are also required in parts of a city a mile or more from a hospital and in sections which are geographically isolated. Every community is requested to reexamine its casualty stations in the light of these requirements and to eliminate all unnecessary locations.

6. *Economy in the Use of Casualty Stations.*—Casualty stations need not be activated in areas where no casualties have been reported. A mobile medical team should always be available at hospitals to activate its casualty station when necessary. A mobile medical team should be dispatched or assembled at casualty stations near incidents only when casualties have been reported in that vicinity.

The mobile team for a casualty station located at a hospital is therefore best derived from the hospital; a mobile team for emergency service at casualty stations remote from hospitals should be derived either from a hospital, if within 3 miles, or from the physicians, nurses and auxiliaries residing in the neighborhood if more than 3 miles away or otherwise geographically isolated.

7. *Central Control.*—The chief of Emergency Medical Service or his deputy at the control center will keep a record of all hospital mobile teams and ambulances in his district and of physicians, nurses and auxiliaries living in the vicinity of each casualty station who are on call for emergency service. He will determine when to dispatch a mobile medical team from a hospital to an incident or to activate community medical personnel for service at an incident or casualty station.

8. *Elimination of Advanced First Aid Posts.*—All fixed first aid posts can be eliminated. Experience has shown that under the conditions of darkness, confusion and dirt that exist at air raid incidents, it is rarely necessary or even possible to establish a temporary first aid post. In the darkness and dirt it is impossible to do much more for air raid casualties on the spot than cover their wounds, control hemorrhage, apply a simple splint and administer morphine before they are removed to the hospital. Most of this work has already been done by rescue workers and the incident physician by the time the casualty is extricated. Only at a large incident with many casualties may it be desirable to establish a first aid post at an appropriate protected site. Even under these circumstances it should be used as a base of operations for medical personnel rather than a place where severely injured casualties are brought for treatment.

9. *Rescue Units.*—Services of stretcher teams are required at hospitals for unloading of ambulances. Stretcher teams (and so-called first aid parties) are not required in the field, for whatever first aid is possible at incidents is done by the trained rescue workers under the direction of the incident doctor. To conserve manpower, stretcher teams may be disbanded as soon as the rescue teams have been organized and trained, or they may be transferred to the rescue service. The equipment of a rescue team will hereafter include four stretchers. An intensive training program for rescue workers will be announced shortly.

10. *Ambulance Units.*—To reduce the movement of vehicles during an air raid, to economize in driver personnel and to expedite the transport of large numbers of serious casualties from the incidents to hospitals, as many ambulances as possible should be remodeled so as to enable them to carry four stretchers. The use of one and two stretcher vehicles greatly delays the movement of large numbers of casualties to hospitals and may result in needless loss of life. To provide adequate transportation of casualties in mass air raids, exposed cities in the target areas require at least one four stretcher ambulance for every ten thousand persons, depending on the location of hospitals and the distances to be covered, and half that number of passenger cars or station wagons for sitting cases. Specifications for the conversion of used cars into four stretcher ambulances will be provided by the medical division, United States Office of Civilian Defense.

11. *Ambulance Depots.*—To be immediately available at all times, four stretcher ambulances and passenger cars (sedans or station wagons) should be parked at hospitals, where drivers are always on duty, or else grouped in ambulance depots located at garages in various parts of the town. Only persons residing in or living in the vicinity of the hospitals or ambulance depots should be assigned as drivers of the vehicles.

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12. *Interhospital Ambulance Units.*—An additional number of large vehicles such as busses should be promptly available day and night for the simultaneous evacuation of hospitals during an air raid. In heavy air raids it has been necessary to move as many patients from evacuated casualty receiving hospitals to peripheral or emergency base hospitals as from incidents to hospitals within the city. In exposed cities in the target zone it should be possible to evacuate all patients from a hospital in two or at the most three hours without utilizing the ambulance transportation of the field casualty service.

PLASMA PREPARED FOR CIVILIAN DEFENSE USED IN BOSTON DISASTER

Blood plasma stored in Boston by the U. S. Office of Civilian Defense and the U. S. Public Health Service in anticipation of enemy action was an important factor in the treatment of victims of the Boston night club disaster, November 28, according to a report to the Medical Division of the Office of Civilian Defense by Dr. Dudley A. Reekie of Boston, regional medical officer of the first region.

The supply of plasma which the Office of Civilian Defense had available in Boston before the catastrophe totaled 2,708 units—sufficient for that number of transfusions. Fifteen hundred units had been acquired jointly by the Office of Civilian Defense and the Public Health Service with permission of the Army, from blood collected for the armed forces by the American Red Cross. Of this amount 500 units of dried plasma was stored in the first regional office, 500 units of frozen plasma in the Boston City Hospital and 500 units of frozen plasma in the Peter Bent Brigham Hospital. Additional reserves amounting to 1,208 units of liquid frozen plasma were on hand in hospital blood banks, the establishment of which had been aided by grants under the program of the Office of Civilian Defense and the Public Health Service. Ninety civilian hospitals in the state of Massachusetts reported during November that they had 3,456 units of plasma on hand. The civilian hospitals in Massachusetts region 5, which includes Boston, had 1,532 units on November 28. In addition to the Office of Civilian Defense reserves, the Red Cross had 200 units in its Boston office. On the request of an official who was unfamiliar with the local resources, the Red Cross sent by plane from Washington 100 units, from Alexandria, Va., 100 units and from New York 72 units. The U. S. Navy also sent 400 units by plane from Washington.

A total of 1,308 units of plasma is known to have been used in the treatment of victims of the holocaust up to November 30. The greater part, 1,102 units, was used at Boston City Hospital, to which 63 per cent of the casualties were dispatched. Of this amount 627 units was from the Office of Civilian Defense reserve stored at the Boston City and Peter Bent Brigham hospitals. The remainder was supplied by the Red Cross and the Navy. Massachusetts General Hospital, with 20 per cent of the casualties, used 130 units from its own plasma bank, which had been aided by an Office of Civilian Defense and U. S. Public Health Service grant. The remaining 17 per cent of the victims were distributed among Peter Bent Brigham, Beth Israel, Cambridge City, Massachusetts Memorial, Carney, U. S. Marine, U. S. Naval, Cambridge, St. Elizabeth's, St. Margaret's and Faulkner hospitals. All except the last five hospitals have plasma banks that have received grants through the Office of Civilian Defense and Public Health Service program.

As of Monday November 30 the civilian hospitals of Boston still had on hand 1,000 units of plasma, and the regional Office of Civilian Defense had 873 units. The Red Cross is replacing the Office of Civilian Defense reserve that was used in order that it may again be available for the treatment of civilian war casualties.

Dr. Charles Wilinsky, Boston chief of Emergency Medical Service, mobilized ambulances and stretcher teams to transport victims to hospitals. Since immediate hospitalization was imperative, mobile medical teams were not called into action at the scene of the disaster.

Dr. Reekie reported that the casualty receiving hospitals mobilized for the emergency according to plans perfected by drills during the past year in preparation for the care of casualties caused by enemy action. "Staff members took their emergency posts, nurses were ready, information services began at once and Red Cross trained Nurses' Aides reported for duty" his report said. Hospital officials indicated that the casualties received more prompt and organized care than would ever have been possible if the Emergency Medical Service plan for war disasters had not been set up and able to function. Two hospitals easily absorbed the major emergency work of the Boston tragedy, Dr. Reekie observed.

MISCELLANEOUS

PUBLIC HEALTH UNDER HITLER

According to *Slovenska Pravda*, Bratislava, of August 25, recently the women's section of the HSLS in Brenner visited the wounded soldiers in the former Jewish hospital of Bratislava. They distributed among the wounded 96 Kg. of various fruits, 28 liters of wine, 2,700 cigarets, 100 cigaret cases and flowers. At first they visited the Croats and then all the others. By this visit the Slovak workers' wives have clearly shown their attitude toward our army.

Zora for August 29 reports that on August 28 a boat with 100 German wounded arrived at Ruschuk.

According to *Aftonbladet*, Stockholm, of October 6, new large transports of wounded Germans have arrived in Norway lately. There are now hospitals for wounded Germans in Oslo and ten other places in Norway.

Stefani of October 2 reports that from Sofia 200 wounded German soldiers arrived there that day. They will stay at the convalescent home at Banki at the invitation of the Bulgarian government.

Radio Lyons of October 6 reports that a train repatriating 900 sick prisoners from Germany had reached Soissons on its way to Compiègne. Radio Lyons on the same day reported that some 40 sick prisoners repatriated from Germany arrived in Limoges, where they were greeted by the regional prefect.

According to Radio Lyons of October 8, 452 sick and wounded prisoners from Germany have arrived at the Gare du Nord.

Pesti Hirlap of September 1 reports that more wounded soldiers have arrived at the military hospital at Pecs. They were taken from the train to the hospital in cars. The train took four days to arrive from Kiev.

Radio Toulouse of September 13 states that a train carrying 233 sick prisoners of war from Germany has arrived in Paris at the Gare de Lyon.

Havas of September 15 states that for over two years seven hundred and fifty doctors have been in captivity. It was necessary to safeguard their rights and their interests. From now on a district will be reserved around the former residence of each doctor now in captivity. No new practice may be set up during the absence of the practitioner or for five years after his return. In towns, doctors returning from captivity will obtain priority for public and private employment. Young doctors still without practices, and medical students, will take the place of foreigners forbidden to practice as doctors in France.

The *Social Demokraten*, Stockholm, of September 25 states that Norwegian doctors and hospital staffs have won special respect for their anti-Quisling attitude. The quislingites have made repeated and vain attempts to win the staff of the Ulleval hospital. Recently a meeting was arranged at which the Oslo municipal chairman, Fritz Jenssen, spoke. Only five of the hospital's staff of fifteen hundred attended.

Het Laatste Nieuws of September 13 announces that, at the beginning of October, Flemish girls will be leaving for the eastern front to serve as nurses with the German Red Cross. All inquiries should be addressed to De Vlag, 42, rue de la loi, Brussels.

ORGANIZATION SECTION

OFFICIAL NOTES

ANNUAL CONFERENCE OF SECRETARIES AND EDITORS OF CONSTITUENT STATE MEDICAL ASSOCIATIONS

HELD AT AMERICAN MEDICAL ASSOCIATION BUILDING, CHICAGO, NOV. 20-21, 1942, DR. HARRISON H. SHOULDERS, NASHVILLE, TENN., PRESIDING

(Continued from page 1143)

Afternoon Session, November 20

THE PROCUREMENT AND ASSIGNMENT SERVICE AND THE AMERICAN MEDICAL ASSOCIATION

JAMES E. PAULLIN, M.D.
President-Elect of the American Medical Association
ATLANTA, GA.

Since last June it has been my privilege to visit quite a few state associations. The physicians of this country look to the American Medical Association for guidance, for advice, for wisdom and for justice in the conduct of the medical affairs of this country of ours. The physicians of this country and, I am satisfied, the general population of this country have implicit confidence in this organization, despite the fact that occasionally one will find groups of individuals who will try to leave an impression on the public that such is not the case.

As an association we have many component branches. Practically all the doctors in the Army are members of this organization. Practically all members of the Medical Corps of the Navy are members of this association. Practically all members of the Public Health Service are members of the American Medical Association. The only way we are ever going to get anywhere in solving the problems that now confront us is through an active understanding and cooperation between all of these groups who stand for the best of medical practice that we are capable of giving to the people of this country.

The Procurement and Assignment Service, of which I am a member, has before it at present a serious problem which has to do with the dislocation of physicians to meet public needs for medical care in many of these mushroom communities that have sprung up about industrial plants. That problem concerns us, it concerns the state organizations which are a part of the American Medical Association, it concerns the Public Health Service, it concerns industry and it concerns the civilian population.

The Procurement and Assignment Service has laid down a formula which may be useful and which will be useful in solving some of these problems; that is, that most of them must be considered at the state level. The problem that confronts us in Georgia would not be similar to that which confronts Illinois. Basically they are the same, fundamentally they are the same. The technic which can be utilized in each one can follow, up to a certain point, the same procedure. The Procurement and Assignment Service, the American Medical Association through its state and constituent county medical societies, the Public Health Service, industry and labor as represented by the civilian population can sit down and reach some kind of a workable conclusion that will help to solve during the present emergency many of these problems that arise, perhaps not on a basis that would be considered ideal, but undoubtedly on a much better and more logical basis than any haphazard kind of method which can be at the present time instituted.

There are certain states in the United States which now are suffering from a definite voluntary withdrawal of physicians from medical practice. Many of those states are to be found in the part of the country from which I come. It is going to be necessary for a great many industrial plants which are located in these areas to redistribute physicians, to dislocate physicians and to get them to undertake work as a patriotic duty in these various communities. That must be done on a purely voluntary basis.

There are problems that you, as secretaries of your state associations, must take into consideration in helping to carry out this program. I refer to the licensure of physicians who move temporarily from one state to another and cannot through reciprocity be licensed to practice medicine in that state. I realize that that brings up for discussion in many of these states the problem of states' rights. But, at the present time we are in a war and the thing we have to do is to win this war. If it takes the temporary denial of a state's rights to allow a physician who is already practicing medicine in some state and who is an ethical practitioner of medicine and is willing to be dislocated and go to another state to render a patriotic service, I think he should have the right to do it.

Grant these men temporary licenses to practice medicine in a given state under supervision of your board of medical examiners, provided they render service in a community that needs it and needs it badly.

There is set up in each state, according to the recommendations of the Procurement and Assignment Service a committee to thresh out these problems. It is a combined committee. It does not represent any group, but it does represent an effort on the part of the Procurement and Assignment Service to obtain the wholehearted cooperation of every one interested in winning this war. That group is set up in a consultative capacity. It consists of the state chairman of the Procurement and Assignment Service, a representative from the state medical association, a representative from the Public Health Service, a representative from industry and a representative from labor. Those are the people who are primarily interested in the medical care of these communities. If this group of people in a consultative capacity—getting rid of prejudices—are willing to go all out to win this war; if they, with whatever help may be necessary from federal agencies, provided the state itself cannot finance the program, will see that industry gets help and that these communities are supplied with a reasonable degree of medical care, we shall have accomplished something extremely worth while.

THE HEALTH OF OUR NATION IN WARTIME

SURGEON GENERAL THOMAS PARRAN
U. S. Public Health Service

For the past two years the Public Health Service has been cooperating with the state and local health departments to meet the many health problems arising out of war and mobilization. Some of these are becoming more urgent and more serious. Current information secured regarding health conditions around military cantonments and vital war industries shows that to four hundred and ten such areas 5,700,000 people have migrated. Much of this shift has been to relatively sparsely settled areas.

For a number of reasons well known to this audience doctors, dentists and nurses have not followed the workers and their families into their mushroom activities.

The war activities of the Public Health Service which are of interest to this group have been, chiefly:

1. To aid the states where health personnel has been withdrawn for military service and to supplement personnel in the boom areas. Many health officers had Reserve commissions. Others have gone into the armed services, and we have been able in some measure to replace the health personnel, usually with less well trained people, which had been withdrawn. Some urgent situations have been corrected in dealing with elemental sanitation and disease control problems in the boom areas.

2. To strengthen and develop more adequate industrial hygiene services. Many states at the beginning of mobilization had practically no industrial health service. Their work has

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been doubled and redoubled, but as yet it has not kept pace with the doubling and redoubling of war industries.

3. To aid in the control of venereal diseases, which is a problem accentuated by war. In reference to this sector, I can say there is no evidence as yet of any increase in the syphilis rate in the general population. This result is in contrast to the experience in Great Britain, where during the first year of war there was a 10 per cent increase in the syphilis cases reporting for treatment, in the second year of the war a 20 per cent increase, and in the third year of the war a 40 per cent increase, with the result that although Great Britain started with a much lower syphilis rate than in this country they have lost in the three years of war all the gains they had made in the preceding decade.

4. To operate the malaria control program around all mobilization and industrial areas where the disease is prevalent. This is a direct federal operation, with federally employed personnel, from ditch diggers to sanitary engineers and entomologists.

5. To provide the medical staff for the Office of Civilian Defense.

In carrying out the first three of these objectives, and excluding the personnel on duty with the Office of Civilian Defense and malaria control personnel, we now have on duty with the state and local health organizations 325 medical officers, 282 sanitary engineers, 220 nurses and 490 laboratory technicians and other specialists. This has not met the urgent needs of approximately double those amounts.

In reference to our work with the Office of Civilian Defense, I am sure most of you are familiar with the general plan of operation. I shall not go into detail. I should like, however, to clarify the purpose of asking some two hundred hospitals to set up teams to staff emergency base hospitals. The idea in back of this movement is that in the target areas we may have a blitz. If that occurs, there is no time to process appointments, to get people under orders and get them moved. Planning needs to be done in advance. So we have followed the army plan of base hospital organization, except for a smaller staff and have asked some two hundred hospitals, chiefly in the target areas, to organize a balanced team of doctors who will be available in the event of a blitz or other very serious emergency to move into the emergency base hospital which will have been established and start operations.

Who is eligible? Any doctor who is at home and who is nominated by the chief of staff of the hospital. Those who are of military age and who wish to join the Army or Navy can submit their resignations from the Public Health Service. The obligation is only for limited service, and that in the event of a dire emergency. Generally speaking, the men who will make up these teams will be the senior doctors, and doctors with physical defects; doctors who have been declared essential and who are continuing to serve in that community.

From the discussion so far today, I think all of us are convinced that the number of doctors in many of the critical war areas is below the danger point. It has been agreed that one doctor to 1,500 population is a minimum safe national average, yet there are many communities in which there is only one half or even one fourth of this minimum safe ratio. It is obvious, therefore, that it will be necessary, as has been reiterated here today, to relocate a considerable number of physicians.

I am on record as saying that I do not favor at this time, in advance of any general national service act, a special law which would apply to the medical profession. I believe we should try voluntary methods to meet this need. I do not believe that all voluntary methods have been as yet fully explored and exploited.

In my opinion, too, this need cannot be met by the Procurement and Assignment Service working alone. I am sure Dr. Lahey agrees to that. In fact, one of the principles submitted by Procurement and Assignment Service, and approved by the War Manpower Commission, was as follows: "As presently constituted, the Procurement and Assignment Service is not in a position to deal with the financial and administrative problems involved in the provision of medical care."

This is a job, obviously, which will require very close teamwork between the government agencies concerned—Procurement and Assignment and Public Health Service—the state and local health authorities, and the national, state and local medical organizations; in other words, the medical profession itself. Each has a very essential part to play if we are to be successful.

Experience has shown that doctors and dentists are reluctant to move into these boom areas unless there is some definite public recognition of the fact that they are performing a vital war function. Financial assistance must be provided, at least temporarily, in almost every instance when a physician is relocated. Obstacles to state licensure must be overcome, as Dr. Paullin has just pointed out. Recruitment, selection and assignment of personnel must be carried out under a nationally directed plan. In many of these areas it may be possible to handle the problem on a local or state basis. In many other areas the problem transcends state lines and offers, if not solved, a potential hazard to the success of the war effort.

We have already had requests in the Public Health Service from a number of states to supply doctors to go to these areas to practice medicine. They have come with the full endorsement of the health authorities, the medical profession, the local Procurement and Assignment and frequently the State Defense Council as well. We are in the process of meeting a few of these requests in an experimental way, assigning doctors and dentists to communities which have no doctors, or where there are serious shortages. They go as Reserve officers of the Public Health Service, in uniform. They do not collect fees on their own behalf. Their patients usually can pay fees. In one area an arrangement has been made whereby the fees which are collected are put into a fund and used for local public health and medical purposes, hospital bills for the indigent, combined drugs, equipping the health center, visiting nurses and so on. The Public Health Service has the legal authority to respond to requests from states for this type of activity, provided the state itself has the legal authority to engage in this activity. In other words, our officer acts as a representative of the state in carrying on a state and local health function.

I think most of you are familiar with the present plans of the War Manpower Commission, under which the Procurement and Assignment Service and the Public Health Service are cooperating in an effort to meet these diverse problems. In situations where the Public Health Service is called on to help, it is commonly agreed that state and local authority and resources are incapable of dealing fully with the problem. In such cases there are several approaches. Not all the situations are by any means the same. For example, one or more medical officers might be assigned by the Public Health Service to a locality to render services on a fee basis, the fees going to the local department to help extend the health service. There might be local agreement that these doctors could render services to a specified group of people; for example, to operate an accident clinic, as is being done in one place; or a sick baby clinic, or an antepartum clinic, or to take care of some other group of the population; or where there are a number of doctors already in the community but a shortage still exists, some easing of the situation can be had if a more adequate visiting nurse service should be set up by the health department to assist the doctors on home calls and in caring for the sick at home. Frequently such a nursing service would minimize the need for medical service. They could screen out the needy from the less needy cases. Moreover, from the outside help frequently can be given to doctors already in the community, assisting them in establishing a better organized type of service through pooling of the doctors' time and equipment; as an example, by the organization of prepayment medical plans or other types of organization better utilization of the limited medical skill may be made available.

All of us know that even before the war our medical forces were not dispersed in proportion to the needs of the population, but proportioned largely on a basis of economic considerations and very unevenly distributed. Their concentration was closely related to per capita wealth, rather than to population. In 1940 we had an average of about 98 doctors per hundred thousand people in the United States. This ranged from 49 in Alabama to 157 in New York State, and local variations were even greater. This fact is significant because much of the population shift we have seen as a result of concentration of armed forces and of ship building has been to states and localities previously poorly supplied with physicians. About 42,000 doctors have left civilian life, or will have by December of this year, to join the armed forces, and from published statements it appears likely that a total of 55,000 will be required by the end of next year. This latter figure represents over one third of the active doctors, and more than two thirds of those doctors in the age group from which the bulk of them must come, that is, under 45 years of age.

In spite of the efforts of the Procurement and Assignment Service, many of these war production areas have lost doctors to the armed forces, communities which could not spare any doctors to start with. There is a growing overall shortage which will make it increasingly difficult, I think, to secure the

relocation of doctors in these areas on a nonaided voluntary basis. It is evident, I think, that many of these areas, with only one fourth of the national peacetime average of doctors, with only one third of the depleted national average, are in a situation which gives us all cause for grave concern.

To keep the men in the Army in fighting trim will require ten times the number of doctors per unit of military population as will remain for the civilian population, and yet civilian war workers and their dependents should have good medical care if production is to be maintained at peak efficiency. This is total war. It is just as important to provide health services for the men and women who produce the food, munitions, airplanes and the mechanical equipment for the armed forces as it is to provide adequate health services for the forces themselves. In fact, I think it fair to say that one of the surest ways to reduce casualties is to make sure that the armed forces have more and better equipment than the enemy. If this is done, the health of civilian war workers must be maintained so that they can produce the equipment.

The effects of the current doctor shortage cannot be accurately measured. We have been fortunate, up to now, in having an absence of epidemics, a low rate for respiratory diseases, for example, and yet it is obviously important for the worker to have care if absenteeism is to be reduced. Care for his family is important, both from the standpoint of the worker's morale and the very practical reason that an employee with a sick child is likely to take a day off if he has to drive 25 miles to see a doctor.

I think it is instructive for us to compare present demands of physicians, both for the armed forces and for civilians, with those in other nations. Germany has less than 55,000 doctors, a number which is shared by both the armed forces and the civilian population. During the war of 1914-1918 there were about three physicians to 1,000 soldiers in the German army, and their number at the present time cannot be very different.

In Great Britain at the outbreak of war there were about 45,000 doctors in the country. The size of the armed forces and the ratio of doctors to enlisted men is not known accurately, but it is believed to be between three and four physicians per thousand men.

The experience of the British in dealing with this problem of doctor shortage has been instructive. By the fall of 1940 it was obvious that the demands of the armed forces for physicians could not be much longer met without resulting in a potentially dangerous situation in the civil population. A temporary committee was appointed to survey the problem. As a result of this committee's studies, recommendations were made in January 1941, and the minister of health issued a memorandum calling on local authorities and voluntary hospitals to review their needs, and indicating that it would be helpful if the armed forces did likewise. Experience soon demonstrated that nothing happened.

At the request of the Central Medical War Committee the government appointed a permanent committee known as the Medical Personnel or Priority Committee to secure the utmost of economy in the use of medical personnel in the armed forces and in the civilian population. The first reports of this committee were published in the *British Medical Journal* of September 5, this year.

After reviewing the needs of the civilian population and the armed forces, the committee, acting with government authority, informed the armed forces it would be necessary for them to use this medical personnel more efficiently. As a result, the Royal Air Force accepted cuts amounting to about 37 per cent of its original demands for the first half of 1941. The army revised its estimates, so that the original demands were reduced nearly 60 per cent, and the navy accepted a cut of 50 per cent in its requirements. The action of this committee with respect to the demands for medical personnel for 1942 has not yet been published. The committee also made several recommendations for the more efficient use of civilian doctors.

That the time has now arrived when similar review must be made in this country I think is evident from the discussions we have had up to now, and the evidence that is before us. I particularly have in mind the address made by the President-Elect of the American Medical Association in Richmond last week, when he indicated that in his opinion it would be necessary to ration doctors, and that it would be necessary for the military authorities to reduce their previously announced needs.

Unless prompt action is taken to solve satisfactorily the problem of medical care for war workers and other civilians in many communities, I fear we are inviting trouble. I am confident that there will be the fullest cooperation of the armed forces in reducing their demands for medical manpower in order to insure that vital war production will be kept up and to prevent any possible collapse on the civilian front.

In recent weeks we have seen from a demonstration that several branches of our armed forces and those of our allies have the capacity for coordinated action in connection with military operations, and on the civilian front we must develop that same high degree of cooperative action. Mutual trust and confidence is a first essential.

The people of this country have great faith in the patriotism and unselfishness which long has characterized the highest ideals of medicine. Ours is a profession of service to humanity, and indispensable and irreplaceable service in this total war. We are fighting it to preserve our common heritage. Our profession is confronted with the immediate task of insuring a minimum standard of health protection and medical care with our depleted professional forces and to secure that care in a reasonable ratio to the people's needs. In this task we must not fail. Only the wisest use of our resources and the utmost devotion to the common cause will suffice.

THE MEDICAL NEEDS OF THE WAR AND THE SELECTIVE SERVICE SYSTEM

COLONEL LEONARD G. ROWNTREE
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WASHINGTON, D. C.

Selective Service appreciates the privilege of discussing with the secretaries and editors of constituent state medical associations of the American Medical Association the "Medical Needs of the War and the Selective Service System."

General Hershey regrets his inability to be with you this year, as he enjoyed meeting with you last year and discussing medical problems of mutual interest. He requested me to assure you of his continued interest and support and also to tell you of his great appreciation for your unremitting efforts to gear American medicine to the needs of war.

Since your last meeting, we have passed from a program of preparedness and national defense to all out, offensive total global war. This situation presents the greatest challenge that our country has faced to date—a challenge to the nation, to every American citizen and especially to every physician.

The nation has a single objective, that of winning the war, but we must cover two functions:

1. Create fighting forces capable of victory on land, on sea, and in the air.

2. Supply, as the arsenal of democracy, the sinews of war—arms, tanks, ships and planes to our own and to the allied forces.

According to the Secretary of War, an army of 7,500,000 is contemplated by the end of 1944, an air force of 2,200,000, ground units of 3,300,000 and a service of supply 2,000,000. According to Secretary Knox, the Navy is already approaching 1,000,000. According to the management Labor Policy Committee of the War Manpower Commission (November 11) it is estimated that the present manpower program will require the services of 62.5 million people (including the armed forces) by the end of 1943. The dual nature of our function introduces innumerable knotty questions in preferential selection.

Our task as a nation is one of herculean proportions. It calls for individual responsibility on the part of every citizen. From now until victory, each and every one of us should live, plan, work, fight and, if necessary, be willing to die for victory!

The war has created an unusual demand for doctors. Medical service is urgently needed on all fronts. The medical profession must and will meet this need, but the situation calls for wise and thoughtful guidance and for cool, courageous leadership.

In time of war, medicine falls into four categories:

1. *Military Medicine*, the care of fighting forces, which takes precedence over all the other needs.

2. *Public Health and Industrial Medicine*, prevention of disease and the welfare of the working forces—the men and women essential to production.

3. *Research Medicine*, which should be expanded to cover all medical problems important to war.

4. *Civilian Practice*, which becomes unduly heavy and arduous and must be attuned to war. With many doctors it involves an eighty hour seven day week.

Medical education, as a corollary, becomes of supreme importance, as it is called on to provide more doctors to cover all these four categories. Medical education at the present time is in need of not only a helping hand but also of a protecting arm.

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AMERICAN MEDICINE'S CONTRIBUTION TO THE WAR EFFORT

American medicine has more to offer its people than has the profession of any other nation in the world. It is contributing the wholehearted support of a profession, second to none, in quality, numbers and professional attainment. The leadership in the profession is excellent, supplied as it is through the American Medical Association, the Army, the Navy, Public Health, National Research Council and many other medical agencies. Our hospitals, medical schools and institutions are unsurpassed anywhere in the world. They are all being converted to war purposes as rapidly as possible.

Because of increased civilian and military demands, a national shortage of physicians is developing, and this obviously necessitates an equitable apportionment of medical services. This is being effected through the Procurement and Assignment Service, an agency charged with this responsibility by executive order. Its functions are to procure doctors for the fighting forces and to investigate the supply and demands of physicians and to protect the needs of the civil population within each county and state. Procurement and Assignment has aided materially in the procurement of medical men for the fighting forces and has contributed largely to the intelligent distribution of physicians to cover local needs.

The national pool is in the neighborhood of 155,000 doctors, with an annual inflow of some 5,300 new fledged physicians. Every effort has been made to increase the incoming stream and to meet the civilian needs despite the large demands of the military establishment. Naturally in war the first responsibility of the medical profession is to the fighting forces. As the shortage increases, the need also increases for organization and reorganization of the services of those doctors who are left on the home front.

Recently, much has appeared in the press concerning the shortage of physicians in rural districts, especially in areas denuded of medical service. The fact remains, however, that many such areas existed previously in times of peace. Yet the present situation does call for some comprehensive program to meet the requirements on a basis satisfactory nationally and to the states and counties concerned.

Importation of physicians may be indicated here and there, but as a rule each state has within itself the wherewithal to meet most of its needs. Where feasible, some simple provision should be given trial first, and in many instances they may suffice. Such provisions might include (1) visits by itinerant doctors to scheduled clinics, (2) fixed routes and schedules for visiting doctors, (3) part time medical service in designated places, (4) reduction to the minimum of unnecessary demands on the part of neurasthenics and hypochondriacs and (5) provision for emergency needs—medical, surgical and obstetric. These could be met locally through the creation of special telephone exchange and a physicians' bureau, whereby the scheduled physician could be promptly notified of existing emergencies.

Such a program could function successfully only with the agreement of the physicians concerned and through a campaign of education carried on by the state and local medical society. In addition, provision would have to be made with the rationing board for tires and gasoline needed in the transportation of physicians covering these designated areas. Likewise sufficient gasoline would have to be made available for the necessary transportation of the sick. Payment for such medical service could be made a matter of mutual agreement. Not charity but medical attention is desired.

The medical needs of sparsely settled districts and denuded areas should be left in the hands of the medical profession. With the aid of the Public Health Service and assistance from the Procurement and Assignment Service, it is capable of meeting this emergency. In order to avoid a crisis in such areas, Selective Service and the Army should be kept constantly informed of the local situation by the Procurement and Assignment Service.

The medical profession has met its responsibilities to the Army and the Navy. The size of the Medical Corps of both the Army and the Navy has now met an all time high. The tardiness encountered earlier was due in part to misunderstanding. At present the national quota has been attained and only five states have failed to meet their objective. This has been accomplished to date, without any serious failure on the part of the profession to meet the civilian needs. Recruitment was necessary, though no compulsion or threat of compulsion was necessary on the part of Selective Service. General Hershey stated publicly that he had faith in our profession and was satisfied that in one way or another American medicine would meet its obligation in this crisis, as it had always done in the past.

Since considerable criticism has been directed unjustly against us, it would seem but fair that due publicity be given now to the fact that medicine has met its military obligations to date.

THE EFFECT OF WAR ON THE FUNCTIONS OF SELECTIVE SERVICE

Selective Service Law and Amendment.—The declaration of war led to the amendment of the Selective Training and Service Act of 1940. War greatly augmented the task of Selective Service, increased the scope of its activities, and the amount and complexity of its work, and thereby added materially to the medical problems pertaining to the examination and classification of registrants.

Before the declaration of war the age limit of selectees was from 21 to 36 years. Subsequently the age limit of 36 years was reduced to 28 years, partially because of the high incidence of defects in older registrants. On Dec. 13 and Dec. 20, 1941, President Roosevelt signed additional Selective Service amendments, some of the major changes in the law as follows:

1. The age limit was increased from 36 to 45 years and provided for the recall into service of those registrants 28 years or over who had been released from service prior to this time.

2. It required every male citizen and every other male person residing in the United States between the ages of 18 and 65 to register.

3. It removed the territorial restrictions as to service of persons inducted into the armed forces.

4. It extended the period of training and service from one year to the duration of the war and until six months thereafter.

5. It made liable for training and service every male citizen and every other male residing in the United States between the ages of 20 and 45. This latter group included aliens, both declarant and nondeclarant.

The most recent amendment concerned the 18 and 19 year olds. It provides that:

1. All males between the ages of 18 and 45 years are now liable.

2. That those men of 18 and 19 years who are pursuing a course of study may have induction deferred, on request, for the completion of the work in the last half of the academic year.

3. That essential workers in agriculture and industry shall be deferred.

Physical Requirements for Induction.—The standard for induction at any one time depends on the urgency of need in the creation of an army, the size of the projected army and the size of the manpower pool. In time of peace the standards were necessarily high, but now they have been altered by the War Department to meet the increased and more urgent needs. Defects, minor in nature, no longer disqualify. The 1-B classification has been eliminated by Selective Service and registrants formerly so classified are now placed either in 1-A or 1V-F, dependent on their meeting the physical standard established in MR 1-9 (March 15, 1942), an' D. S. S. Form 220 (obvious defects).

Change in Type of Physical Examination.—Because the final authority for induction rests in the Office of the Surgeon General, and because of the developing shortage of doctors and of the definite increase in the rate of induction, the nature of the physical examinations given by Selective Service and by the army examining boards, has undergone substantial change. Selective Service is now giving only a preliminary physical examination, a coarse kind of screening designed to disqualify those with obvious defects. In this connection, each local board medical examiner is provided with a list of diseases calling for rejection, D. S. S. Form 220.

This type of examination can be done satisfactorily only by a physician, and it should not be left to the lay members of the local boards. It consists in careful inspection of each and every selectee in the nude and in action to rule out those manifestly unfit for service. In addition, blood is taken for serologic tests and information is assembled locally, relating to the personality, nervous and mental record. The data are transmitted to the Army Examining and Induction Board for its guidance. Simultaneously, with the changes in the examination by Selective Service, more and more emphasis has been placed on the quality and thoroughness of the examinations at the army examining and induction center.

At first the necessity for the change to the preliminary type of physical examination was not understood by most of the medical profession, but now the wisdom of it is becoming apparent to all. With the growing shortage of physicians and the increasing numbers of men to be processed, the continuation of the complete examination at local board level has been rendered virtually impossible.

Change in Character of Selective Service Examination.—Originally, physical examinations were carried out to a large extent in the offices of the examining physicians, but gradually, through the help of the hospitals and medical schools of the country, group team examinations came into existence. They are responsible for reducing the time of individual examinations from forty-five to fifteen minutes.

"Conservation through consolidation" is now being carried to still greater lengths, thanks largely to the excellent leadership afforded us in our work here in Chicago. Selectees are now being examined in groups of 1,000 to 1,200 men, through the services of some thirty to forty physicians and three to five laboratory workers. Whereas formerly 2,000 physicians were necessary for this purpose, it is now being carried on by some 165 doctors through mass examinations held in various parts of Chicago on different days each week.

This new development has met with enthusiastic response and is rapidly spreading to other large urban centers throughout the country. The doctors, accustomed to streamlined laboratory medicine, are now enjoying the experience of recognizing pathologic conditions through the use of their senses and medical experience. This policy of conserving doctors' hours through consolidation of their efforts offers a ready solution of the problem of the shortage of physicians. Though some reports of developing shortage have been made in three or four states, subsequent investigation has revealed that, to date, there exists no actual shortage of physicians for the medical function of Selective Service.

Whereas formerly Selective Service sent up to the army boards all registrants considered likely for induction, the army examining physicians rejected all those who were considered doubtful or questionable for military needs. Now the greater urgency of need has brought the point of view of the examining physician of the Army much nearer to that originally held by the examiners of the Selective Service System.

Need for Reexamination and Reclassification of Rejectees.—Beginning September 1, I-B men have been in the process of reclassification. By the first of the year this group-reexamination will be almost completed. There now exists a large pool of class IV-F men, and with the increasing urgency of need, many so classified now may be considered qualified; hence some at least of the 1,500,000 men in this IV-F group will undergo reclassification. Undoubtedly, some salvage in manpower will result.

SELECTIVE SERVICE STATISTICS

The third statistical survey by Selective Service jolted the nation out of its complacency so far as its ideas relative to the health and physical fitness were concerned. It constituted a mirror which reflected our defects, deficiencies, disorders and disease. Under the old system of examination, 50 per cent of the registrants were rejected; 41 per cent through Selective Service and 9 per cent through the army examining and induction station. With the new system of examination, 42 per cent are now being rejected, 11.3 by Selective Service and 30.7 by the Army authorities. This reversal of figures is due largely to the fundamental change in character of the two examinations.

Three factors are perhaps responsible for the increase in the percentage of inductions: (1) the lowered standards for admission, (2) the changes relative to age limits and (3) the urgency of need for men in the fighting forces. Doubtless, selection is now based on a somewhat better knowledge of what the Army wants and can utilize to advantage.

Changes Incident to Age.—The third survey showed, at the age of 21, 70 per cent qualified for service, whereas at 36 less than 30 per cent were inducted. Now the age limit has been extended in both directions from 18 to 45 years. The information relative to those of 18 and 19 is too limited to permit of conclusions. However, at 22 years 64 per cent qualified, while at 45 only 14 per cent met the requirements. Roughly speaking, at 22 years 13 out of 20 qualified, as opposed to 3 out of 20 at the age of 45. These figures should be given careful consideration in determining age limits for military service, especially in view of the criticism which has already been directed toward the induction of older men, many of whom after induction are failing to meet military requirements.

SELECTIVE SERVICE, THE MEDICAL PROFESSION AND MEDICAL EDUCATION

A cumulative shortage of physicians was foreseen early in the work of Selective Service, and from the very beginning it has been provided for adequately. In February 1941, at the Congress of Medical Education and Licensure, Selective Service presented a positive program covering this field, advocating the deferment of third and fourth year medical students and first year interns. Recommendations also were made at that time for increased enrolment and for acceleration in the tempo of medical training. Shortly thereafter an Ensign Corps was set up by the Navy and somewhat later a Medical Administrative Corps by the Army in order to assure the armed forces of an adequately trained medical service. In the interim all these suggestions have been adopted and are proving of great value in increasing the output of young doctors.

During the last two years this program has been extended to include, in addition, the first and second year of medical training and the last two years of premedical training. At the present time the premedical student who is a bona fide matriculant in an approved school is considered for deferment. That this program of Selective Service and the armed forces has been entirely adequate is attested by the uninterrupted training of medical men now going on in all of the medical colleges of our country. According to Dr. Rappleye the number of graduates in 1943 will have increased from 5,300 to 9,400 and in the following eighteen months to 10,725. This represents an increase above normal of 33 per cent. In addition at least 5,000 refugee physicians are to be considered. It is desirable perhaps at this time to pause and visualize the profession five years hence from the standpoint of war or peace needs and also from the standpoint of the medical students who are now protected up to 1948. Without doubt many parts of the world will have to turn to this country for leadership at that time to meet their postwar medical needs and a large number of physicians can, in all probability, be used to great advantage. A worldwide shortage of physicians will probably constitute one of our postwar problems.

In passing, attention should be called to the fact that American medical students studying in Canada are considered by Selective Service exactly on the same basis as students in this country. Some difficulty has arisen from time to time relative to Canadian medical students who are visiting this country for the purpose of study; however, to date these students have been handled on an individual basis and the results have been quite satisfactory.

One Year Internship.—In a conference held some eighteen months ago at Selective Service headquarters, an agreement was reached concerning a one year rotating internship. Selective Service is still of the same opinion and, with the Army and Navy, advocates this plan. In Canada, according to Brigadier General Meakins, nine months' internship is in force at present, but the plan calls for a return to the one year internship at the earliest time convenient. Dr. Rappleye has officially informed our headquarters that New York is willing and ready to take over the services of all superfluous interns, not otherwise provided for, in their fourth intern quarter.

Selective Service has been unwilling to defer medical men for prolonged internships and residencies, since the military need for men of this age is so imperative. Resident staffs can, of course, be created where feasible, with men disqualified for military service, with women, and with married men especially those past military age. Hardships unquestionably will result, but Selective Service is committed by agreement to this program in the interest of creating an adequate military force.

Protection of Full Time Medical Teachers.—Occupational Bulletin 23, issued under date of September 30, was issued by the War Manpower Commission to meet the need for full time teachers of medicine who themselves may or may not be physicians. They may now be listed as essential men and will be considered as such by Selective Service, if properly certified.

Substandard Schools.—Recognizing the fact that substandard schools, if denied protection, will disintegrate, Selective Service has sought advice in relation to two schools in particular. Students of these schools are now being deferred, and the graduates of these schools are being commissioned, at the discretion of the Surgeon General, under conditions imposed by his office. Two of these schools, in the opinion of Selective Service, are sufficiently well qualified to entitle them to thoughtful consideration. It is hoped that official action concerning them will be forthcoming at an early date.

SOME SUGGESTIONS OFFERED BY SELECTIVE SERVICE TO MEDICAL EDUCATORS

Because of its many broad national contacts, Selective Service feels impelled to offer some suggestions to medical educators of the country—some of which may appear to merit your consideration:

1. *Pooling of Students, Facilities, Faculties in Large Urban Centers.*—With the large increase in the educational burden which has fallen on medical teachers, the pooling of medical

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students, facilities and faculties might effectively be accomplished in certain of the large urban centers. The advantages of such a program under existing conditions are fast becoming apparent. To us it seems that this warrants careful study.

2. *A National Board for the Selection of Medical Students.*—With the induction of the 18 and 19 year old men, medical education will be forced to undergo certain modification. Irrespective of the auspices under which such education is conducted, safeguarding of the "selection" of medical students should be exercised. Only those specially trained in this field are capable of making the wisest selection, and wise selection is of national importance now and also for the future. In this connection, Selective Service has suggested the creation of a supervising national board of admission to medicine which would be comparable in some respects to the National Board of Licensure. Such a board would permit the pooling of the premedical students and their wisest selection and distribution among medical colleges. Applicants could be selected up to 50 and 100 per cent in excess of the needs and continuous screening be exercised, thereby reducing the number to the optimum who can be accommodated and to those best qualified for training and graduation.

3. *Wartime Changes in Teaching.*—Changes in the curriculum to meet war needs are desirable. Obviously, many changes are needed in the present day to meet the medical needs of the fighting forces. In this connection Selective Service respectfully requests that some consideration be given to the problems of "the selection of men for military service." The curriculum should give prominence also to personality problems and to nervous and mental states of men scheduled for military service. Dental defects, since numerically they early constituted the greatest cause of rejections, should be given the attention they merit.

PROBLEMS CREATED BY THE INDUCTION OF YOUTHS OF 18-19 YEARS OF AGE

The induction of the 18 and 19 year old youths creates many new problems especially in relation to college students. Our interest naturally centers most on premedical students. There are two methods of handling the situation, or possibly a combination of the two.

1. Occupational deferment to a selected group of students, which would permit them to continue their education through a period of college preparation agreed on by the Army, the Navy and other governmental agencies on the one hand, and the educational institutions on the other.

2. The creation by the Army and Navy of one or more special enlisted corps reserves.

Dr. Willard C. Rappleye in a recent letter has submitted some very interesting information. "The American Council on Education has appointed a Committee on the Relationships of Higher Education and the Federal Government to consider and propose the most effective manner in which these policies could be implemented. That committee, of which President Edmund E. Day of Cornell University is chairman, has recommended to the Army and Navy that collegiate training corps be created at designated institutions for the Army, Navy, Marines and Coast Guard. If the general plan is carried out, these corps will be made up of young men who have been inducted through Selective Service into the armed forces and who have then been selected during the period of their basic military training of approximately thirteen weeks to enter college for a period of professional or specialized training and education.

"It has been proposed that the selection of candidates for these several corps and their retention for further training shall be made by the appropriate military authorities in cooperation with the educational institutions. The boys will be under military discipline, in uniform and on government subsistence and pay. Since the boys for the Collegiate Training Corps will be selected because of their ability and aptitude and without regard to their ability to pay for a higher education, many promising students will be given educational opportunities which otherwise would not be available to them.

"It is planned that as far as possible the inducted young men may apply to any university, college or junior college which will require such candidates to undergo specialized and general officer training of a standard approved by the military authorities. There is likelihood that the students in the Collegiate Training Corps will be obliged to pursue a year around curricula not to exceed four semesters.

"The medical school authorities believe that it is not possible to select medical students until after a certain period in college. It would be necessary, therefore, to earmark likely candidates in numbers considerably larger than can be accommodated in medical schools and screen this number from time to time until it is brought down to the proper proportion."

Because of the kaleidoscopic changes which confront us, General Hershey is unwilling to offer any plan of action at the present time. He asked me, however, to state that the present Selective Service policies in this field will hold, subject to change, of course, in the event of any radical change of policy on the part of the War Manpower Commission.

No doubt it is obvious to most of you that, since the average age on graduation from high school is 17.2 years, adequate numbers of premedical students will be available for one year of premedical training at least, and that, without any new form of protection. In addition, the new amendment to the Selective Service Act provides for deferment for those in the second half of any academic year of training, provided they request it.

The crucial question from your point of view is, I know, Will protection materialize in some form? At least it is being attempted. Dr. Edward C. Elliott, Chief, Professional and Technical Personnel of the War Manpower Commission, informed me that medical students will be high on the list of priorities. He states that I might quote him as saying "Highest preferment is being requested for premedical students and we expect to get it."

Before leaving this question, attention should be called to the recent action of the Council on Medical Education and Hospitals of the American Medical Association whereby uniform standards for admission are recommended and also a uniform period of study: two years of premedical work and three years of accelerated training in the medical colleges.

REHABILITATION AND PREHABILITATION

The medical care of soldiers is the best that the country can give. More medical attention, however, is needed for rendering registrants well and fit prior to induction and also when possible after rejection.

As you all know, in October of last year President Roosevelt presented his plan for the rehabilitation of 200,000 men rejected by Selective Service because of physical defects. This program was subjected to a pilot test of a limited scope in the states of Maryland and Virginia. However, the change in the physical requirements for induction and the decision of the War Department to induct I-B men resulted in the wholesale induction of those registrants originally scheduled for rehabilitation. After a four months trial General Hershey decided that the results did not justify the effort on the part of Selective Service. The problem was, therefore, referred to the War Manpower Commission for allocation to some other agency better equipped to carry on the program. This to date has not been done.

The need for a national program for rehabilitation is still great and it should in all probability include not only rejectees but also sick essential workers in war industries. Those vitally interested in this field will find in the service of the New Jersey Rehabilitation Commission a model which might well serve the nation's need.

The program of prehabilitation was suggested by Selective Service some one and one-half years ago. It is now sweeping the nation in the various preinduction programs that are being developed. It embraces two features:

1. The correction of remediable disqualifying defects prior to examination.

2. A program of physical exercise designed to harden and toughen the fiber of youth.

Many preinduction educational programs involving physical training are now in operation in various localities throughout the country. One such program has been developed in New York State under the leadership of Governor Lehman's war council and the professional direction of Dr. Hiram Jones. This has attained unusual success. More than 3,000,000 students in New York State are now undergoing physical training of the most desirable kind. This program also constitutes a model worthy of consideration for national needs.

Education, Health and Physical Fitness.—The responsibility for the physical condition of the youth of this country does not rest on them alone. The situation represents a combined failure on the part of the state, the community, the parents, the teachers and the individual. The correction of the existing situation calls for the combined effort of all those listed.

On the campus the "student health organizations" occupy an unusually fine position, not only to determine physical defects, but also to remedy them. The student health organizations are creating "wartime health councils" to meet the needs of approximately one-half million university students.

For all the various physical fitness programs suggested, wise medical guidance is highly desirable, indeed quite necessary. In this connection, Selective Service has suggested the creation of an official council on student health in the National Headquarters of the American Medical Association, analogous to the Council on Industrial Health. Such a council, no doubt, could help very materially in determining the reasons for past failure and also in developing adequate programs for betterment of health and physical fitness among American students.

THE PROBLEMS OF NERVOUS, MENTAL, PSYCHOSOMATIC, VENEREAL AND DENTAL DISEASES

Selective Service is attempting to improve the efficiency of selection for military service, especially in the field of nervous and mental disabilities. It is attempting to assemble and transmit to the army boards as much recorded information as is available on the nervous and mental state of the registrants. The Army is attempting to increase its efficiency in this field through the work of psychiatrists and psychologists and through a three day period of observation when needed. In addition, rejectees who are considered as unjustly disqualified are subject to study by psychiatrists on the medical advisory boards. In the event of disagreement with the Army's decision, such registrants can be and are resubmitted.

Psychosomatic diseases are being made the basis of intensive investigation through the cooperation of the National Research Council; special studies are being initiated on groups of men rejected because of cardiovascular disorders. The possibilities in this field are thereby being explored through a pilot test now being conducted.

The wisdom of the United States Public Health Service in demanding serologic tests is now apparent to all. The Army is developing a program for venereal disease through the induction of a limited number of cases of uncomplicated gonorrhea. No doubt the program will expand as facilities for the medical care of venereal diseases are provided.

In this connection, attention might be called to the experimental approach to treatment now being conducted in Wesley Hospital under the direction of Dr. Bundesen, president of the Chicago Board of Health. It represents a serious attempt to compel treatment, to render cases rapidly noninfectious, to determine the effectiveness of different procedures, and the amount of treatment necessary under the different regimens. This is an experiment that merits careful scrutiny on the part of the Army, the Navy, Selective Service and other agencies.

The situation in the dental field in this country as revealed by Selective Service is far from satisfactory. Despite the excellent work of the dental profession, the simplest rules of dental hygiene are being largely neglected. As a result there is need for dental rehabilitation, and above all for a more comprehensive program for the prevention of dental disease, and for the wholesale extraction of teeth.

In closing, Selective Service wishes to express its appreciation for the cordial cooperation of the American Medical Association, the Association of American Medical Colleges, the American Dental Association, the National Research Council, the Army and Navy of the United States, United States Public Health Service, Veterans Administration, the Procurement and Assignment Service and other federal agencies. All of these agencies have contributed much directly to the war effort, but in addition they have helped indirectly also through their hearty cooperation in all the medical functions of Selective Service.

PHYSICIANS FOR CIVILIANS

CREIGHTON BARKER, M.D.
Secretary of the Connecticut State Medical Society
NEW HAVEN, CONN.

It is almost my wish that, instead of speaking to you, you might talk to me, for I would like to know what you think about the shortage of doctors and what the circumstances are in your localities. Some of you come from states where I have never been, and although the purposes and ideals of medical care are fundamentally the same everywhere I know there are important little differences of tempo and practice that must be considered whenever we think of medical care in a given area, and you have that on the spot information.

You and I are the quiet stewards of the professional affairs of more than a hundred thousand physicians giving a basic human service across this great land, and the knowledge of medical practice that we have gathered from our experiences, from our successes and our failures, is not equaled by any other group of people. To be sure, we are secretaries and kind of bookkeepers for our societies, but we do lots more than collect dues and arrange banquets and try to find medical prima donnas who are not dreary after dinner speakers. That is what it may seem that we do, but there is constantly flowing across our desks a stream of knowledge and information about medical practice and medical care and medical people within our areas that cannot be duplicated, and we more than any others are responsible for what the public thinks about medicine in our home states. In a small state like my own all of this is relatively simple, but I know that others of you have this knowledge too in great states like New York and in great empires like Texas. Much of the knowledge that we have might not stand sharp critical analysis by professional planners, for it is knowledge that cannot be filed anywhere except in our heads and hearts, and to us a doctor is bound to be more than a card with a lot of holes punched in it and a community is more than a pin on a map. The possession of knowledge has always brought responsibility, and our understanding of the present medical care problems brings us a grave interest in their solution.

Many things have happened since you and I met together here last year. Probably no one of us then imagined how rapid the sequence of events would be and certainly no one of us now would dare to guess how far reaching will be their effects.

First we were concerned in seeing that the armed forces had their doctors, and although an official government agency was established for this purpose and in only a few instances were state secretaries personally involved with the activities of that agency, the knowledge and machinery that we have was put immediately to work to aid in the accomplishment of the job then at hand. For the present, at least, it is done. It was done in different ways in different places, for some of us are fire eaters and like to swing our arms around, and others are calmer and more deliberate; but it seems that just about as much was accomplished one way as the other. You and I can see some mistakes that were made and often we know why they were made and that the making of those mistakes contributes to our present dilemma. We know that the careful and well ordered process that had been wisely set up by the Procurement and Assignment Service was in some instances set aside by the occasionally precipitate methods of the army recruiting boards. We know that, fine as the Procurement and Assignment Service was in its concept and valuable as it was, it was limited in its usefulness by lack of authority and that it could do a better job if it might be given some implements besides thought and persuasion. We know that the public was not always accurately informed about our progress and that there were occasions when the patriotism of physicians in this country was unhappily assailed. More than anything else we know that the whole job has been done by harassed and busy men without thought of reward, and for them we have nothing but respect and admiration.

Now as the glow of our first achievement wanes we find ourselves faced with the necessity of sitting down and looking over what is left and deciding what to do next. No one questions anywhere that the men in the services must have the very best of medical care. American people take that for granted, just as they take for granted that we are going to have the best guns and planes and generals, and it is no part of ours to enter into the debate if the ratio of physicians to the troops, as prescribed by the Army and Navy, is too great. That is a matter to be decided by expert knowledge and experience which we do not have. Be that as it may, the public now quite rightly wants to know who is going to take care of it when it gets sick. There are a lot of people at home with important jobs to do, and this phase of medical care in wartime belongs peculiarly to us. I may be wrong in this observation, but it is my opinion that the public looks to the Army and Navy, that is to say the government, for the care of our soldiers and sailors; but that same public still has respect and hope for American medicine and looks to us to see that it is taken care of on the home front. I have discussed this subject in lots of places during the past few weeks, on trains with strangers, with people whom I know, all kinds of people and I have not yet been impressed that many of them think that it is a government job. Perhaps I have gathered an incorrect impression, and even though it is right it may not work, but I am sure that you and I, with the knowledge that we have and the confidence that is given us, have a great responsibility in seeing through this part of the wartime medical program. I know the same government agency that was entrusted with the selection and the recruiting of officer candidates has been given the responsibility in the civilian field also, but we have a job to

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do alongside that agency, helping it at every opportunity, because we know the circumstances of medical care and medical practice within our states better than any one else, and through the means at our disposal we can add to and improve that knowledge from every nook and corner of this country.

The most valuable knowledge we shall acquire is to know whether there is actually a shortage of physicians in a particular area. There has been some hysteria about this in spots. Sometimes important and vocative people think there is a shortage because their own doctor or doctors have gone away, and we should not be surprised that persons in public life, or aspiring to position in public life, have grasped on this exciting subject of doctor shortage as a means of obtaining attention for themselves. By this I do not mean to imply that there are not some areas in need of doctors, but nice judgment has to be brought to bear on the problem in every case and all the facts viewed against the background of local conditions, and I think we are capable of doing it.

Our methods for answering the problem and helping with the relocation of physicians can be simple and free of all the time consuming detail of officialdom which is surely something these days. Within every state there are always some doctors seeking new places to locate and looking for fields that are greener, and we are quite likely to know about these men. I realize that now there are not a large number who come into that class because many of them are already in the services or they are busy enough where they are, but we shall be able to pick up a few, and perhaps in some states it will take only a few to fill the dangerous gaps that have been left. In most states the state society is closely related to the medical examining board where licenses to practice medicine are obtained, and although it is uncertain how many applicants for new licenses there will be in the immediate future, at least we do have an opportunity to know about those that are issued and can study the possibilities of locating some of the new licentiates, and in other instances understand and make clear the possibility of licensing physicians who can be removed from another state.

Some of the problems that present themselves may be answered by a redistribution of medical time. That is to say, it is possible, and has already been done in some places, to have the physicians remaining in a community spend a part of their time, perhaps a morning a week, in a nearby area whose population has expanded and where medical personnel is inadequate. No agency can adjust a delicate matter like this as satisfactorily as a medical society. Probably the local society could do it best because its members understand the level of fees charged in that locality and could, without favor, arrange a distribution of the work among men willing to do it. State societies may well take the leadership in proposing arrangements of this kind, leaving the final details of operation to the county association. More efficient use of the time of doctors can be accomplished if the public gives just a little help and is willing to be considerate about sending calls to the doctor's office early and not expecting much care for trivial things. Our part in this is to see that the public is informed and frankly ask its help; public opinion will not put doctors into critical areas but it will help in the effort to adjust.

In some cases I know that none of our measures will be successful and other means, perhaps drastic means, will have to be discovered; but the first large part of the answer, I believe, is up to us. Maybe it is too early to be optimistic about the extent of the assistance that we may give, but it is also too early to be pessimistic, and let us not have it said that we did not try and that we did not see that it was something our people expected us to do and we did the very best we could about it. Above all, let us seek the truth and know what the circumstances are. This will require flexible and unselfish thinking on our part. Then when we know that truth let us tell our people honestly and fairly, confident that they will understand and try to save them from being misled and alarmed by propaganda from any source.

In making the suggestion that a large part of this responsibility belongs to you and me as secretaries of state medical societies, I do not wish to seem to trespass in any way on the function of the Procurement and Assignment Service; and whatever we do must always be done in cooperation with that service and in the spirit of being helpful to it. In most states this cooperation will be easy, for I know that all of you have worked closely with the Procurement and Assignment Service in the past. Right now this is medicine's greatest enterprise as I see it, to see that our hard working people who are winning the war at home are taken care of, that their productiveness is not interrupted and that their health is safeguarded. It is our job now just as it always has been.

CHAIRMAN SHOULDERS: The Chair will take occasion to state that the Committee on Medical Preparedness of the American Medical Association was created in 1940. It was created at the request of government authorities. At the end of one year that committee recommended that a procurement and assignment agency be created. However, it was recognized then that the doctor left at home and not wearing a uniform would still be participating in the war activity. A committee was created, and Dr. Walter Donaldson was made chairman.

FUNCTIONS OF WAR PARTICIPATION COMMITTEE

WALTER F. DONALDSON, M.D.
Secretary of the Medical Society of the State of Pennsylvania
PITTSBURGH

Up to the present, there has been no specific request made of our committee beyond one which concerned itself with the problem that has been extensively discussed here today and that has to do with medical service, more especially to the war related industries.

The War Participation Committee of the American Medical Association, in response to the request which came from the Manpower Commission through a subcommittee of Procurement and Assignment, headed by Dr. Selby, asked the Council on Industrial Health to develop a plan which would enable the medical profession to contribute more directly to industrial health activity in small industrial plants. That action came as a result of the direct challenge made by Mr. McNutt at the Atlantic City session of the American Medical Association last June, at which he said, having given full credit to the American Medical Association's Council on Industrial Health and Dr. Selby's Committee on Industrial Hygiene, Health and Medicine for having arranged many problems, that there yet remained the need to reach and obtain the cooperation of local practitioners, and that the efforts up until that time (in June) had not produced results.

If they have not produced results, it is not the fault of the Council on Industrial Health here at the home office. We learned that rather belatedly in Pennsylvania. If any one of you has as yet failed to call them to your help and aid, I recommend them to you highly. They not only came into Pennsylvania and helped us organize certain counties; they not only came there and were represented at county society medical meetings, but they sent a splendid exhibit to our annual session, and I again recommend them to all of you.

I know I shall not need to bestir the memories of many of you very much to ask you to remember the effect of the challenge contained in the statement that went forth four or five years ago all over this country to the effect that one third of the people in the country could not obtain medical service when they needed it. It stimulated most of us, I am sure, into improving the opportunities for more people to get more and better medical service in most of our states, and I shall be very much disappointed if every one of our state medical organizations doesn't accept this challenge by Mr. McNutt to proceed to improve the opportunities for your own members to learn something, at least, about the new problems that are developing under modern war industries. It is foolish for us to claim we already know it, because there are new risks developing with every new process in chemistry or in industry.

However, it is not beyond the reach of the average state and many of the county medical societies to bring their members up to date on the basic principles of these problems. What we need, I believe, is to hold our present position in the respect of the people of this country in relation to this important problem, and there is no more important problem than the winning of the war; we are all satisfied of that. And when the people of this country hear, as they always hear, the unfavorable things, such as "There are not sufficient doctors in this country who know anything about industrial hygiene to serve the all important war industrial work"—when such a challenge becomes broadcast, then you should immediately react in such a way as to let the people know that we are on the way to meeting that situation. They are fully aware of the fact that this is not only a changing world but a changed world, and they don't expect a profession like ours, which depends largely on basic sciences to keep six months ahead of events, but they do want to know that we, who accept the responsibility for representing the rank and file of the medical profession, are alert and are doing everything we can to see to it that our members learn to meet this situation.

And I would feel that I wasn't meeting this, my first, opportunity to speak to you as a chairman of a very important committee whose responsibilities I almost shirked from, if I didn't

try to lay on your shoulders the responsibility of going back to your home states with the determination that no county medical society under your jurisdiction will go another thirty or sixty days without once again having this responsibility brought home to it.

Our committee wants to recommend that every state medical society develop as rapidly as possible a Committee on War Participation, whose functions may yet need to be determined, but whose principal function to begin with, at the present time, is to see to it that these things that mean so much to the future of the practice of medicine are kept under observation.

There isn't a state medical society, and there shouldn't be a county medical society that isn't ready to say "Yes, we are here, not to take complete leadership, but to endeavor to coordinate all the agencies in our district that should be connected with this health project." That is your responsibility; that is your function. Don't attempt to create the impression that you want the entire leadership, but assume the initiative and then carry the ball so that you may at least have a coordinating influence that will result in every group in every community turning to the county medical society and the state medical society, because they know there are men there and committees there who don't claim to know it all, but who do want to help bring about the necessary results to win the war in as short a time as possible.

GENERAL DISCUSSION

DR. MICHAEL A. TIGHE, Boston: Dr. Lahey has told you that one of the serious difficulties which his agency is meeting is the matter of the failure of states to recognize that we are in a war and that something ought to be done about loosening up some of the licensure regulations in these states. We have met that situation in Massachusetts. We discussed this matter with our board of registration and medicine and found that it was sympathetic to the proposition. It took the matter to the governor of the commonwealth, and he said "If the Massachusetts Medical Society approves of it I will, under my executive wartime powers, issue such an order." The attorney general, in considering it, asked us to demonstrate that there was in Massachusetts at that particular time a necessity. We could not demonstrate it in Massachusetts at that particular time, but the attorney general distinctly said, and I have a copy of the letter which he sent to the secretary of registration and medicine in my hand, "When and if such a time arises, when and if it becomes necessary for the proper performance, for the proper medical care of the people in Massachusetts, I will give my assent to such a regulation." I move that this group of editors of medical journals and secretaries of state societies be recorded as favoring such modification of state licensure laws for the duration of the emergency as will facilitate the voluntary movement of physicians from one state to another for purposes of practicing their profession, when such movements are recommended by the Procurement and Assignment Agency.

SECRETARY OLIN WEST: I don't want to discuss the motion myself other than to state that I have recently heard in personal conversations with members of the Association who drop in to see us from time to time from various states that they feel this matter ought to be considered not alone from the standpoint of dislocation but also from the standpoint of relocation after the war is over.

DR. GEORGE H. KRESS, San Francisco: In California I think we would be somewhat dubious concerning the value of the proposed expression of the assembly. Where are these doctors to come from whom we are going to send to other states, and why should it be necessary to break down the licensure laws which in some of the commonwealths have taken years and years to bring into being? Only last week I was speaking with the secretary of the state board of medical examiners on this very subject, and he hoped that any contemplated measures having to do with a change of the licensing standards of the state of California would be given most careful consideration, because our experience out in the Far West has been that by and large it does not work for the development of better standards. It seems to me that a method of this kind had better be left to the individual states and the constituent state associations to work out for themselves.

DR. A. T. MCCORMACK, Louisville, Ky.: I don't think there is any danger of anybody going to any of the states who haven't sent their quota to the Army because there are enough of them staying in California, and in these other states there will be no necessity for anybody going there. We expect somebody to come from California to Kentucky if the situation remains as it is. If the situation remains the other way around we shall be delighted to receive them. I will say that anybody who comes to Kentucky—we need about two hundred—will be licensed in fifteen minutes if he is recommended by his county medical society as an ethical member of the practice and legally qualified to practice. We are hospitable. We shall be happy to have them and will see that they get a good living in medicine and are given real opportunity for fine service. We are having lots of extra babies down there, and we ought to have somebody to take care of them. I think you ought to amend your resolution to say that we wouldn't expect any of the states who haven't given their quota to the armed forces to offer any hospitality to those who come from without.

DR. W. P. EAGLETON, Newark, N. J.: As one who has had a good deal of experience in the building of the medical licenses in the state of New Jersey, who has seen all the stages which they have gone through—you know we are far ahead of any other state; we license osteopaths and we give them the right to practice medicine and surgery, provided they will fulfil certain requirements—and you fellows won't recognize them. You needn't laugh. You are doing the same thing that you did to the homeopaths. We began in 1890 and, one after another, we have added to the original medical practice act. I think it is a great mistake for somebody from Massachusetts, who has a school they want to recognize and don't know how to recognize it, to come here and offer a resolution with which we all agree, but when you establish a rule without knowing what you are doing——It is a mistake to adopt any resolution that in any way would put the separate states on more or less the defensive, if they didn't want to accede to it. I think this matter should be referred to the Council on Medical Education and Hospitals and then they can call in whom they please.

DR. HAROLD S. DIEHL, Minneapolis: As one who has had the privilege of serving as a member of the directing board of the Procurement and Assignment Service I would like most enthusiastically to endorse the expression of appreciation voiced by Dr. Lahey for the splendid work that has been done by the corps area and state committees of the Procurement and Assignment Service. The men on these committees are the ones who have done the job and who have made the Procurement and Assignment Service function and work. You really are the ones who are on the firing line, and I use that term advisedly. You have done an excellent job. Knowing this, it makes one's blood boil to read statements in the lay press by self-styled experts on medical care, either in special articles or in hearings before Congressional committees, that imply or state directly that the Procurement and Assignment Service program has failed miserably and that some other agency should be given the authority to draft and assign physicians to meet civilian needs on a national basis. I have had the privilege of visiting many state and corps area offices of the Procurement and Assignment Service, and nothing could possibly be more heartening than to see the excellent job that has been done by the men on these committees, and it has been done under difficult situations, with little support, assistance or even direction from a central office. I am sure there is no other agency or no other group in this country that could possibly have done half so good a job. As I say, those of us on the directing board realize that it is really the men and the secretaries of state societies who have, in a sense, been the forgotten men in this picture, because they have done much of the actual work for the state and local committees.

As to this problem of medical care, particularly projecting the needs of the armed forces into 1943, as Dr. Lahey and other speakers said this morning, the needs of the armed forces will increase during 1943, and in the conference Dr. Lahey spoke of a tentative figure as to the number of physicians that safely can be withdrawn from civil practice for 1943 as being agreed on by the heads of the various armed services, the Public Health Service, the War Manpower Commission and the Procurement and Assignment Service. Steps at the present time are in progress to assign to the states a reasonable quota of this total need to be provided. These quotas will be arrived at in essentially the same manner as the quotas of last year. They will be distributed, however, over several months of the year; that is, I think you will receive monthly quotas rather than an annual quota. In withdrawing additional physicians to meet these 1943 quotas, in spite of the fact that they will be much smaller than the ones for 1942, we are faced with a much more difficult job than we have at the present time, because there are relatively few areas from which doctors can still be taken without causing severe problems in relation to provision of adequate care for the civilian population. The state committees

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of the Procurement and Assignment Service will soon receive from the central office a request to reclassify every physician remaining in each of the states. Every physician should now be reclassified as to whether his services are essential for civilian medical care or whether his services can be made available either to the armed forces or for medical service to meet emergency civilian needs in other areas. The Procurement and Assignment Service is anxious that the most careful possible consideration be given to building up these lists of physicians who can be made available, and we are anxious to have not only lists of men who can be made available but the order in which they should be withdrawn from the civilian population. You will receive those requests in the near future.

As to this problem of provision of medical care for the civilian population, the importance of that, I am sure, was appreciated by most of us months ago. It fell to my lot for the Procurement and Assignment Service in Washington to do a good bit of the leg work that led up to the development of certain principles and policies of procedure, and I had the privilege and the Procurement and Assignment Board had the privilege of consulting with the U. S. Public Health Service, which is concerned and has a responsibility in this field, with the officials and Trustees of the American Medical Association, and with other groups, and I want to say that from every source we received nothing but assurances of complete and wholehearted cooperation. It seems to me, and to all of us, that there never has been a greater expression of willingness and desire on the part of these groups to work together to meet this common need. As I think many of you know, out of a great many preliminary discussions there was formulated a set of principles to govern the provision of medical care in these emergency areas. Those principles were agreed to by the Public Health Service and by the Trustees of the American Medical Association and were then submitted and approved by the War Manpower Commission. Following the acceptance of the principles, the next step, obviously, was how to make them work, how to put them into practice. Dr. Barker has presented the working possibilities that have been considered. One of the fundamental points in those principles that we all were anxious to see adopted was that, as far as possible, these problems of medical care should be met by local medical facilities, particularly at the state level. As to how to meet these problems, the suggestion has been made by the Procurement and Assignment Service that a committee be formulated in the state to investigate the need. Obviously the first question is to determine just what the need is. Reports that we are now getting indicate that in many areas there is really no emergency problem in medical care. In other areas the problem is not one of providing additional physicians but the problem is one of meeting public health needs. Possibly there is a sanitation problem, or there may be public health nurses or some hospital facilities that are needed, rather than physicians. In other areas there is need for physicians. When those needs exist or are determined to exist, the next step is how to meet them. There again such a committee, representing the interests of the various groups that are concerned with this problem, should undertake to formulate and put into operation a plan for meeting that need.

I am sure that all of us concerned with the Procurement and Assignment Service were particularly pleased at Dr. Fitzgibbon's report this morning on how this situation is being met in Oregon, because that was a report of a practical situation being met in exactly the manner we hope most of these problems will be met. There will be situations, of course, in which it is impossible to meet the medical needs in the manner that Dr. Fitzgibbon and his group have done it in Oregon, but even in those situations where additional physicians are needed and it may be necessary to bring them in from other areas within the state or possibly attempt to get physicians from other states, we feel that the state committee should formulate the plan that seems best adapted to the particular situation. In formulating those plans, the Procurement and Assignment Service on the corps area level and on the federal level, and the Public Health Service on the district and federal level in cooperation with the Procurement and Assignment Service is more than glad to offer consultation service and to assist in every way in appraising the need and in helping to work out what seems to be the best possible solution. It has been suggested that some of these can be met by better utilization of the physicians already in the area. In other instances it will be possible to induce some physician to move into the area just on a private practice basis. Another possibility that has suggested itself, and seems practical in some situations, would be to put the physician on a salary or on part salary for a period of time. That would be particularly true if you are going to get young physicians who don't have the funds to set themselves up in practice, possibly to put a physician on part salary for a time, with the understanding that he may build up a private practice and the understanding that he will remain in the area, say, during the war emergency, or for at least a reasonable time. Funds to put physicians on such part salary probably could be obtained by the appropriate official state agency, state health department, or whatever it may be, from a federal agency, probably the United States Public Health Service. It is possible that funds could be made available. Another area has been suggested. Possibly some prepayment plan would be desirable, and in still other areas it may be necessary to bring the physician into the area on a full salary basis. Possibly, as has been suggested, some of these situations could be met only by assigning some one to the area from the Public Health Service. However, in all those situations—whatever is the best way of meeting those needs—we are desirous that the problem be studied and recommendations made by those responsible at the state level.

The question has been asked Where are we going to get physicians to meet these needs? That, of course, is exceedingly difficult, and we cannot, I am sure, bring the level of medical care at a time like this up to what we would like to have it. There are many areas where there has never been what might be considered adequate medical care, but certainly we cannot expect to correct those at a time when there is a national shortage of physicians. There are some physicians, however, who have expressed a willingness to serve the nation during the war emergency, physicians who are not acceptable on account of physical defects or on account of age for commissions in the armed forces. Some of those will be available. Another group which I think we can particularly look to to supply numbers of physicians to go into some of these areas are the interns and residents of hospitals who are physically not qualified for service. The country over, there are going to be a considerable number of those, probably twelve to fifteen hundred a year, who will be physically disqualified for service. Some of those young men are willing and anxious to serve the nation and will be glad to go into some of these production areas to render medical care. Others, I am sure, can be persuaded to do so, and I think we should have that group particularly in mind and that we should take the initiative in attempting to point out to them the opportunities and the obligations to serve their nation during the war. At the present we are assembling a list of names of all the interns and residents in this country, who are serving at the present time, who do not hold commissions in the armed forces because they are physically disqualified. The names of those residents and interns will be sent to the respective state chairmen of the Procurement and Assignment Service with the suggestion and with the hope that personal contacts will be made with them in regard to the possibility of their serving the nation and serving the profession during this war emergency. This is, as has been said, probably the most difficult problem that has ever faced the profession. It is one, however, which at the present time we have the opportunity to meet in our own way and with our own methods, and I am sure that we must not and will not fail to meet this challenge.

DR. KRESS: In connection with the matter of handling the problems of mushroom communities, of which we have a goodly number in the state of California, I think it would be of interest to you to know that the Medical Service Organization of the California Medical Association and the California Physicians' Service has been the intermediary agent that has handled this problem, and in this way: The California Physicians' Service is now making contracts with the Federal Housing Administration for places for nurses and the necessary medical personnel in the communities. A recent city has grown up. Laredo City, across from San Francisco, had an influx of seven thousand, and across the bay a similar problem came into being. We emphasized that the California Physicians' Service will go in and place the necessary medical personnel to take the load off our local men and to carry on; however, always in conjunction with the component county society. If you have medical service organizations of that type, you will find that they are the easiest and the best solution for that particular problem, and in California I think we have a larger number of them than in practically any of the other states. We are happy to know that the plan is working out in splendid fashion.

Dr. Harold M. Camp, Monmouth, Ill.: Dr. Barker asked for information from a few states, and as a secretary and editor, and state chairman for the Procurement and Assignment Service of one of the slacker states referred to by Colonel McCormack, I should like to give Dr. Barker a little information that we have picked up. We have in Illinois something over 12,000 physicians. I might say, Colonel McCormack, that our quota is approximately 33⅓ per cent of the total number of physicians registered in the state of Illinois. We have 5 medical schools, 4 of which are accredited. We have 388 hospitals, most of which have essential men. We have 5,638 physicians under the age of 45, and our quota is something over 70 per cent of that total number. That is one reason we have not yet been able to make our quota, but we propose to do it by the end of the year. We have physicians living and practicing in 859 communities, and we have repeatedly made reappraisals of all our counties. We have 102 counties, and we have 102 county committees of Procurement and Assignment, and we have repeatedly made appraisals since early this year. About once a month we send letters to all the county committees asking for definite information and requesting complaints. As a result of our more recent investigations we have 19 complaints. I think possibly 6 of those were referred to the governing board and Dr. Lahey. Several of these were not justifiable. We had 1 complaint which was first registered by an energetic chamber of commerce secretary, undoubtedly at the request of his board of directors.

There happen to be 4 cities together, without a country lane, a corn field or anything more than a city street at the boundary line, with a population of 90,000, and across the river half a mile, on the Iowa shore, is another city, making a metropolitan area of 170,000 people. It so happened that the city making the complaint, being 10,000 larger in population than the neighboring city on the Illinois side, had about half as many resident physicians as the smaller of the two cities, and the complaint was that we were taking more physicians out of the larger city than out of the smaller 1, where we had the most doctors. It was rather unfortunate that out of 10 physicians physically disqualified in these 2 cities, 8 came from the smaller of the 2. So the chamber of commerce said Procurement and Assignment was recommmending the taking of too many men from this 1 city. We discovered that for a population of some 90,000 they have about 68 physicians remaining in the 2 cities at the present time. Their complaint went not only to Dr. Lahey but also to the President of the United States, Mr. McNutt, the 2 United States Senators from Illinois and quite a bunch of Congressmen, the commanding general of the sixth corps area, the governor of the state and a few other dignitaries. All these copies eventually came back to our desk, asking that we make an investigation. That was the result of our reappraisal made, not piecemeal, but through a number of sources.

We had 1 very unfortunate condition arise through no fault of Procurement and Assignment. In a county seat of 3,000 population were 2 physicians the same age. We made both of these men available, with the understanding that when 1 of them was examined and accepted the other automatically would be held as essential. The first man was examined and physically disqualified. He was told he was not eligible for commission for limited service. So we made the second man available and held the disqualified man as essential. The second man was examined and passed his examination, and he was told to be in readiness to take off in about three weeks. A week before this man left, the first man had a telegram from General Ulio, the Adjutant General, saying they had changed the order, that he was accepted for general service and his commission was on the way, and he was given five days to go to camp. Here was a community without a doctor, apparently. We got busy and largely through telephone service succeeded within three days in getting 2 physicians in this community to take the place of the 2 men who ultimately went into service.

I wanted to tell Colonel McCormack that out of some 12,000 physicians—we have 102 counties—8,000, or two thirds of them serving half the population of our state of a little over 8 million, are in 1 county. We have 4,000 in the other 101 counties, or 1 physician for a thousand people. Our downstate counties are well stripped, and the men remaining there are going to be held as essential for the time being. We have had a serious problem in Cook County, with over 8,000 physicians, particularly because even though the Chicago Medical Society has 4,900 members there are 2,700 who are not members of the Chicago Medical Society in Cook County. Some of these fellows will have a dozen different locations in one year and, consequently, no one but the draft board can keep up with them. We finally went through the draft boards to get a complete list of these men, and they are now being processed at something like 100 or 150 a day.

Dr. Holman Taylor, Fort Worth, Texas: When we began about six months ago to realize that we were about to dislocate too many doctors, the state medical association—not the Procurement and Assignment Service—began to make a realistic, not a statistical, survey. We wanted to find out how many doctors actually were at home, how many of them could render how much service, how many people there were to be served and how badly they needed doctors, and we asked a conference of secretaries and the Procurement and Assignment Service to furnish us the data we needed. We gradually worked out a chart. The Procurement and Assignment assistant, which Dr. Anderson is, can take the chart and find out what the ratio of doctors is in any group of counties. We have 254 counties. There are lots of areas there that don't have any doctors at all. We group them in the county societies. One society has 10 counties, another 9, another 6, 7, right along, but we take care of the counties individually and collectively. For instance, to take 1 county, this is revised once each month. There are now 24 doctors in that county. The number deemed essential there is from 15 to 18. There is 1 Negro physician. We put great responsibilities on the Negro physicians down in Texas. We work with them beautifully, believe it or not. There are 6 physicians there who can render the service of only 3. There are 3 not in practice, and there is 1 osteopath. I can say "osteopath" as state secretary; I can't as Procurement and Assignment chairman. We didn't care about him, but we wanted to know he was there. We found out some surprising things about that. So the ratio in that particular county is 1 doctor to 1,788 people, and so on down the line. Here is 1 county that has 1 doctor to 1,600 some odd people. What do the statistics show? That there are 18,334 people there. There are 3 physicians there now serving that many people. They have sent 1 doctor into the service, and that 1 doctor brought that ratio to its high estate. It looks like a critical area, but it isn't any more critical than it always was. They consider 3 can do the work. The doctors themselves say they can do that work, and they are now getting all the work they can do.

Summarizing all of this, we have broken it down to some very interesting conclusions, the first of which is that we have now only 3,436.5 active doctors in the state, after we take out those who have entered the service. We found that 1 county had 9 doctors who could perform the service of 4, so we just say they have 4 doctors and not 9, because they haven't got 9 doctors, as 1 or 2 of those have died from "coronary conclusion," as my cook calls it, since this thing started. In spite of the fact that we have greatly overrun our quota, we find that in Texas, according to the census, we have 1 doctor to 1,881 persons. That isn't greatly above 1,500, is it? But taking the estimated increase in population we have 1 doctor to 2,035 people. We revise this chart each month, and we know just what we are doing.

Just a word about these critical areas. I don't believe a single area which has been reported to me as critical has been found to be critical on investigation. Most of those complaints come from interested people. As some speaker said today, when you take a man's doctor he thinks there is a great depletion of doctors. We have had chambers of commerce, presidents of banks, district clerks and even Selective Service boards complain and raise a row about not having enough doctors. I sent 1 doctor down to an area from which they sent me a petition with 800 names. The president of the bank, the president of the chamber of commerce and the district judge came to see me as a committee. I got hold of a perfectly good doctor up in Michigan who wanted to come back home where it wasn't so cold. He was a graduate of Johns Hopkins. He went to the president of the chamber of commerce, who said "We don't need any more doctors here. We have three doctors." Two doctors are past 70, 1 has "coronary conclusion" and the other has had a stroke. He discouraged the doctor from locating there.

We are working out each of those cases realistically, which brings me now to the only other observation I want to make. Somebody mentioned the matter of rationing tires for doctors. That is a serious problem for doctors in Texas, as it is in other states. There are doctors who have their cars laid up because they can't get retreads. There are doctors down there who are not given casings because they don't make calls. There isn't a doctor in the state of Texas who won't make a call if he is asked to make it. It is ridiculous that, because he doesn't hold himself out as making calls, he can't have tires for his car. With the gasoline restrictions coming on, what are we going to do about this thing? Now I am speaking as state chairman of the Procurement and Assignment Service. We have got to visit county medical societies and these county

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groups and find out just what the situation is in these alleged critical areas, and there isn't any way to do it in Texas except by automobile, except in a few instances. I have I automobile, and it belongs to my wife. It is comparatively new and the casings are comparatively good. I will gladly keep on using my automobile, my rubber and my gasoline if they will give me some more and if they will let my wife use it. Somebody had better be doing something for these state chairmen who must get out in their areas to see what the situations are that are complained of and do something about filling them. We can fill them. We can't fill them altogether from Texas, because there isn't an area in Texas that isn't just about as critical as another area, and you can't borrow from Peter to pay Paul down there. You can't take from 1 pocket and put it in another, because it won't do any good. There is no money in either pocket. Somebody has to get out and rearrange these things. We can do it if we are given the facilities, and we can't do it if we are not given the facilities.

SECRETARY WEST: I am glad Dr. Taylor mentioned this matter of transportation facilities, or the lack of transportation facilities. There are various ramifications of that general subject. Down in Texas they never have any snow, or not much. Whenever they have anything they have a lot of it, but they don't have much snow. But in other parts of this country they have a lot of snow, and in certain parts they have a lot of mud. I don't know whether I have been overanxious or not, but I have been making the most strenuous effort to impress the Office of Price Administration with the fact that every physician in this country who actually lives in what might reasonably be called distressed areas—a distressed area, in my opinion, is one where there is 1 physician to cover a territory within a radius of from 7 to 25 miles; I don't care whether it is distressed under war circumstances or any other circumstances—I have been doing my best to change the regulation so that these men who have to travel on deep snow and muddy roads can serve the people who need medical service. I don't give a darn about the doctor's inconvenience. The doctors have shown they can stand as much inconvenience as anybody else, and they have done it. But the only answer I can get from Washington is that the doctors must undergo inconveniences, like everybody else. Although I have continued to try to impress them with the fact that it is not the inconvenience of the doctor I am interested in and that the doctors themselves are interested in, but that it is the need of the people for medical service that is essential, I have exhausted my resources. I got a last letter myself from the Office of Price Administration, and again they refer to inconveniences. I don't know whether I brought it up here with me or not. But I am telling you that nobody is going to be able to do anything about this tire situation, Dr. Taylor, unless you can stimulate your Congressmen, and they disclaim ability to do it. I have a bunch of letters in my desk right now from Representatives in Congress who acknowledge their failure to make any impression whatever on this situation. The pressure on these people has got to come from where the people are. If you are going to get anything done about your tires, Dr. Taylor, you are going to have to get some of those New Deal Congressmen busy, and keep them busy until they can make some impression on this situation. I don't care whether you do it or whether you stimulate others to do it, but it certainly needs to be done. These doctors tell me, on the basis of years of experience, that they simply do the work they are called on to do. The Office of Price Administration writes me that they have consulted the tire experts, and that the wear on snow tires is very little more than it is on any ordinary tire. The doctors tell me that just isn't so. I consulted some tire experts myself, and they don't agree with the government experts. They tell me that the shimmying of snow tires on hard roads wears them out much faster than it does the ordinary tire. I am bringing this to your attention just for the purpose of telling you that if you need these things for the people themselves and for essential service nobody but doctors can deliver, you have got to get the pressure from home. The American Medical Association has exhausted its resources in this matter, and it is up to those people at home to bring the necessary pressure. It can't be done in any other way.

(To be continued)

MEDICAL LEGISLATION

DISTRICT OF COLUMBIA

Change in Status.—H. R. 7781 has passed the House, defining the real property exempt from taxation in the District of Columbia. The bill exempts from taxation hospital buildings belonging to and operated by organizations which are not organized or operated for private gain, including buildings and structures reasonably necessary and usual to the operation of a hospital; buildings belonging to and operated by schools, colleges or universities which are not organized or operated for private gain and which embrace the generally recognized relationship of teacher and student; and buildings belonging to and used in carrying on the purposes and activities of the Medical Society of the District of Columbia. Also exempted are the grounds belonging to and reasonably acquired and actually used for the carrying on of the activities and purposes of any institution or organization entitled to exemption, including additional grounds belonging to and forming a part of the property of such institutions or organizations as of July 1, 1942. The exemption of additional grounds, however, may be granted only on the filing of a written application to the commissioners of the District of Columbia, supported by an affidavit that such additional grounds are not held for profit or sale but only for the enlargement and expansion of the institution or organization. Institutions, organizations, corporations or associations owning exempt property must, on or before March 1, 1943 and on or before March 1 of each year thereafter furnish the commissioners of the District of Columbia a report, under oath, showing the purposes for which their exempt property has been used during the preceding year and a copy of the report must be forwarded to Congress by the commissioners.

MEDICAL BILLS IN CONGRESS

Bill Introduced.—S. 2902, introduced by Senator Davis, Pennsylvania, proposes to amend an act to regulate and improve the civil service of the United States by providing that no person shall be discriminated against in any case because of his or her blindness or impaired visual acuity, in examination, appointment, reappointment, reinstatement, reemployment, promotion, transfer, retransfer, demotion, removal or retirement.

Change in Status.—H. R. 7568 has passed the House and Senate, a bill proposing to discharge more effectively the obligations of the United States under certain treaties relating to the manufacture and distribution of narcotic drugs, by providing for the domestic control of the production and distribution of the opium poppy and its products, and for other purposes.

STATE MEDICAL LEGISLATION

New Jersey

Bills Introduced.—S. 358, to regulate the practice of nursing, proposes (1) to waive present registration requirements where applicant meets the requirements that were in existence at the time of his or her graduation from an approved school of nursing, or the requirements existing on April 1, 1914, if the graduation was prior to that date; (2) the authorization of reciprocal registration of qualified Canadian licentiates; (3) to lower the age limit of students in approved nursing schools from 18 to 17½ years during the period of the war and for six months thereafter. A. 412 proposes to authorize an approved medical school to give the required four courses of lectures of eight months either consecutively or in four different calendar years. A. 413 proposes to amend the existing provision authorizing a lawfully qualified physician of another state to take charge temporarily of the practice of a New Jersey licentiate during his absence by conditioning such authorization on permission granted by the board of medical examiners and by providing that before a temporary licensee may enter on such practice he must submit proof that he can fulfil the requirements demanded in the other sections of the act relating to applicants for admission by examination or indorsement from another state and by providing that the temporary license shall be for a period of not less than two weeks nor more than four months. Such limited licensee must pay a fee of $25 for his license.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

Annual Registration Due January 1.—Every person practicing medicine, surgery or osteopathy in Arizona is required by law to pay annually on or before January 1, to the board of medical examiners, a renewal license fee of $3. Any licentiate who does not renew his license as required above is to be penalized $1 for each day that he practices without a renewal license, not to exceed $50. The board of medical examiners is to revoke the license of any licentiate who fails to renew his license for three successive years.

ARKANSAS

District Meeting.—The Ninth Councilor District Medical Society was addressed, among others, at the Hotel Seville, Harrison, December 2, by Drs. Melvin E. McCaskill on "Abortion, Miscarriage, Missed-Abortion"; Joseph F. Shuffield, "Industrial Injuries," and Homer A. Higgins, "Selective Service Medical Problems." All are from Little Rock.

Annual Registration Due On or Before January 1.—All licentiates of the State Medical Board of the Arkansas Medical Society are required by law to register with the board on or before January 1 and at that time to pay such fee as has been set by the board. If a licentiate fails to pay the required annual fee before March 1 of any year his license to practice automatically expires but may be reinstated on the payment of all delinquent fees and a penalty of $1 for each year, or part thereof, of delinquency.

CALIFORNIA

Annual Registration Due January 1.—Every practitioner of medicine and surgery holding a license to practice in California is required by law to register annually, on or before January 1, with the secretary-treasurer of the board of medical examiners, and at that time to pay a fee of $2. Failure to pay the required fee within sixty days after January 1 works a revocation of a license and thereafter a license may be reissued only after application and the payment of a $10 penalty. The required fee, however, is waived with respect to licentiates serving in the armed forces of the United States or in the United States Public Health Service.

Psychiatric Service in Venereal Disease Clinic.—A psychiatric service has been made available in connection with the San Francisco city venereal disease clinic, 33 Hunt Street, as a special field study project by the U. S. Public Health Service. A reeducation and readjustment program for females who offer a promiscuous sex history and who may spread venereal diseases will be provided. Those showing maladjustment will be referred to the psychiatric service, which will attempt to offer them a "potentiality of social and economic readjustment." The service will not attempt to assist in the socioeconomic readjustment of confirmed prostitutes. Patients referred to the clinic who, in the opinion of the personnel of the psychiatric service, are not amenable to psychiatric and case work treatment will be discharged from the clinic on preliminary interview. As far as the psychiatric service is concerned there will be no residence or financial requirements, and the service will be in a position to consider cases referred from outside sources. Arrangements will be made with various nonofficial agencies to provide funds in certain instances to carry out recommended psychiatric treatment plans. Attempts will be made to relocate the patients through cooperation of official and nonofficial agencies concerned. The medical director of the clinic is the chief of the division of venereal diseases, Dr. Richard A. Koch. The director of the psychiatric service of the clinic is Dr. Ernest G. Lion, who is instructor of psychiatry at the Stanford University School of Medicine. The personnel of the psychiatric service will consist of a psychiatrist, a chief psychiatric social worker, an assistant psychiatric social worker and two clerks.

CONNECTICUT

Annual Registration Due During January.—Every practitioner of medicine and surgery holding a license to practice in Connecticut is required by law to register during January, with the state department of health, and at that time to pay a fee of $2. Licentiates who have retired from active practice or who live out of the state must register annually but need not pay a fee. A practitioner failing to register is liable to a fine of not more than $5.

GEORGIA

Campaign Against Hookworm.—In a campaign against hookworm, the state department of public health is using a case finding plan to locate families suffering from the disease. Physicians, welfare directors, school superintendents and other agents are being questioned in an effort to trace all cases or suspected cases. A concentrated program will be carried on between December 15 and March 15.

Statewide Quarantine on Venereal Diseases.—A quarantine of all persons with venereal disease has been declared by the Georgia Department of Public Health in an order establishing regulations for control of venereal diseases and providing compulsory detention centers. According to *Georgia's Health*, the quarantine was made applicable to "all persons who have been directly exposed" to venereal disease as well as to those actually infected. No isolation posts or quarantine stations have been established yet, but one or more will be put in operation as quickly as possible in cooperation with authorities of the counties where they are located. These will be financed largely by the federal government. The state board of health will provide for transporting persons to the isolation posts and, when they are cured, will return them to any place in the state to which they wish to go. The state board bulletin reports that Georgia now has an epidemic of venereal diseases of such proportions that it is a menace to public health and a threat to an all out war effort. The order was adopted in response to requests of army and federal public health officials for measures to protect soldiers from venereal diseases.

ILLINOIS

Dr. Stevenson Receives Award.—Dr. Walter D. Stevenson, Quincy, first president of the Mississippi Valley Medical Society, was presented with the society's distinguished service award for 1942 during the recent annual meeting in Quincy. The award is given annually to an active member of the society for "unusual and distinguished service to the medical profession." Dr. Stevenson is a charter member and president of the board of trustees of the society and served as its first president, in 1935.

Chicago

Meeting of Bacteriologists.—The Society of Illinois Bacteriologists held a meeting at the Chicago Illini Union, December 11. The speakers were Willard Turner, Ph.D., on "Bacteriological Aspects of Egg Drying"; Henry R. Kraybill, Ph.D., "Dehydration of Meats," and Milton Levine, Ph.D., "Toxicity of Human Plasma."

Old Wesley Hospital Dedicated as Venereal Disease Unit.—Special ceremonies marked the opening and dedication of the Chicago Venereal Disease Hospital in a seven story building at 2449 South Dearborn Street, November 29, the old Wesley Hospital. The speakers include Vice President Henry A. Wallace, Dr. Thomas Parran, surgeon general of the U. S. Public Health Service, and representatives of the Army and Navy. Federal and city funds totaling $425,000 will finance the institution for the first year. Dr. Herman N. Bundesen, president of the Chicago Board of Health and health commissioner, will be in charge of the institution until he chooses a permanent director.

Meeting of Association for Crippled.—Mr. George H. Williamson was chosen president of the Illinois Association for the Crippled, Inc., at its sixth annual meeting at the La Salle Hotel, November 27. Mr. Jules L. Brady and Miss Thecla Doniat were chosen vice presidents; Mrs. Arthur C. Bachmeyer, secretary, and Mr. William S. Turner, treasurer. Mrs. Lola M. Armstrong is the executive secretary. All are of Chicago. Dr. Edward L. Compere delivered the presidential annual message at the luncheon session and E. Jay Howenstine, Elyria, Ohio, executive secretary of the National Society for Crippled Children of the United States of America, Inc., discussed "New Federal Rulings and Pending Legislation Affecting the Physically Handicapped." The scientific program was devoted to a symposium on "Marshalling Resources to Utilize Physically Handicapped Workers."

KANSAS

New State Ophthalmologist.—Dr. William W. Reed, Topeka, on November 1 was appointed state supervising ophthalmologist to the Kansas State Board of Social Welfare. Dr. Reed succeeded Dr. Hazen L. Kirkpatrick, Topeka, who recently resigned to accept a commission as captain in the medical corps of the U. S. Air Corps.

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LOUISIANA

Director of Maternal Welfare Joins Medical School.—Dr. Virginia E. Webb, chief, division of maternal and child welfare of the state department of health, New Orleans, has recently been appointed clinical assistant in the department of obstetrics and gynecology at the Louisiana State University School of Medicine, New Orleans.

Annual Renewal Due January 1.—Every practitioner of medicine and surgery holding a certificate to practice in Louisiana is required by law to have his certificate renewed annually, on or before January 1, by the secretary-treasurer of the state board of medical examiners, and at that time to pay a fee of $2. The board may by unanimous vote revoke any certificate not renewed.

MINNESOTA

Annual Registration Due During January.—Every practioner of medicine and surgery holding a license to practice in Minnesota is required by law to register annually during January, with the secretary of the board of medical examiners, and at that time to pay a fee of $2. A licentiate who practices without renewing his license is guilty of a misdemeanor and is liable to prosecution.

The Ninth Bell Lecture.—Dr. Thomas J. Kinsella, clinical assistant professor of surgery, University of Minnesota Medical School, Minneapolis, delivered the ninth annual Bell Lecture before the Hennepin County Medical Society, December 7, under the joint auspices of the Hennepin County Medical Society and the Hennepin County Tuberculosis Association. His subject was "Modern Surgical Treatment of Tuberculosis."

Society News.—Dr. John L. Emmett, Rochester, addressed the Ramsey County Medical Society in St. Paul, November 3, on "Newer Drugs in the Treatment of Urinary Infections" and Dr. Arnold Schwyzer, St. Paul, gave a clinical talk on "Abdominal Pain."——The Minnesota Academy of Medicine was addressed in St. Paul, October 14, by Drs. Moses Barron and Owen H. Wangensteen, both of Minneapolis, on the medical and surgical management of peptic ulcer, respectively.

MISSOURI

Dr. Julianelle Goes to New York Research Institute.—Louis A. Julianelle, Ph.D., associate professor of applied bacteriology and immunology in ophthalmology, Washington University School of Medicine, St. Louis, and chairman of the trachoma commission there, has been appointed chief of the division of infectious diseases of the Public Health Research Institute of the City of New York, Inc. Dr. Julianelle received his doctor of philosophy degree at the University of Pennsylvania, Philadelphia, in 1922. He served there as instructor in bacteriology until 1924, when he joined the staff of the Rockefeller Institute Hospital, New York, as assistant. Later he served as bacteriologist and associate there, joining the Washington University faculty in 1930.

NEW YORK

Annual Registration Due January 1.—Every practitioner of medicine and surgery in New York is required by law to apply annually, on or before January 1, to the secretary of the board of medical examiners for a certificate of registration, on application forms furnished by him, and to pay at that time a fee of $2. The law authorizes the secretary of the board to permit secretaries of duly incorporated medical societies to act as his representatives to receive and transmit to him such applications and fees. Practitioners are liable to severe penalties for failing to register and for continuing in practice thereafter.

New York City

Harvey Lecture.—Dr. John R. Paul, professor of preventive medicine, Yale University School of Medicine, New Haven, Conn., will deliver the third Harvey Society Lecture of the current series at the New York Academy of Medicine, December 17, on "Poliomyelitis."

Report of Public Health Research Institute.—A report has been issued by the Public Health Research Institute of the City of New York, Inc., for the period July 1, 1941 to June 30, 1942, during which time it carried on health research for the city under a temporary contract. The ten year contract calling for payment of $100,000 annually by the city to the institute did not go into effect until July 1 of this year. Otto A. Bessey, Ph.D., formerly research associate in pathology and associate in biologic chemistry, Harvard Medical School, Boston, has been named director of the institute for the duration of the war, replacing Dr. Ralph S. Muckenfuss, who has been called into army service. Dr. Muckenfuss' position as director of the bureau of laboratories of the city department of health is being filled by Dr. Wheelan D. Sutliff as acting director. Dr. Bessey is also chief of the division of nutrition and physiology of the institute. A report by Dr. Thomas M. Rivers, director of the Rockefeller Hospital and chairman of the scientific council of the institute, stated that one of the objects of the division of nutrition and physiology "is determination of the amount, type and degree of nutritional inadequacy in the population of the city of New York; to determine the nature and extent of the handicaps from such inadequacy, and to develop and suggest corrective measures."

NORTH DAKOTA

Annual Registration Due January 1.—Every practitioner of medicine and surgery holding a license to practice in North Dakota is required by law to register annually on or before January 1, with the secretary-treasurer of the board of medical examiners, and at that time to pay a fee of $5 if a resident of North Dakota, or $2 if a nonresident. A practitioner may not lawfully practice if he has not registered. If he does so his license may be revoked and can be reinstated on the payment of unpaid fees and $0.50 for each month of default.

OHIO

Doctors' Orchestra Suspends Activities.—Because 30 per cent of its members are now serving in the armed forces, the Doctors' Symphony Orchestra has temporarily suspended its activities after a successful career of sixteen years. Founded as the Physicians' Orchestra by nine physicians and two medical students in November 1926, it was transformed into the Doctors' Orchestra, composed of physicians and dentists. Two years later the personnel had increased to symphonic size and the present title, the Doctors' Symphony Orchestra, was assumed. The orchestra has played for hospitals and medical and dental societies in Akron, Barberton, Wadsworth, Canton, Columbus and other communities. Benefit concerts have been given for the City Hospital, Akron, the Wadsworth Municipal Hospital and the Citizens Hospital, Barberton. In all, one hundred and three appearances have been made in eleven Ohio cities and towns. According to the *Bulletin* of the Summit County Medical Society, the suspension of activity is not permanent and will depend on the duration of the war. Dr. Alexander S. McCormick, Akron, has been director since the establishment of the orchestra. The concertmaster is D. H. Henninger, D.D.S., Akron, and the assistant concertmaster, Dr. Arthur Dobkin, is now in service overseas as a major in the Army.

PENNSYLVANIA

Annual Registration Due January 1.—Every practitioner of medicine and surgery holding a license to practice in Pennsylvania is required by law to register annually, on or before January 1, with the board of medical education and licensure in the department of public instruction, and to pay a fee of $1 or such fee as may be fixed by the department of public instruction. A practitioner who fails to register and who continues to practice is liable to a fine of from $10 to $100.

Society News.—Dr. Helen B. Taussig, Baltimore, will address the Harrisburg Academy of Medicine, December 15, on "Significance of Changes in Size of Heart in Rheumatic Fever and Congenital Malformations of the Heart in Relation to the Growth of the Child."——Dr. Lloyd F. Craver, New York, discussed "Cancer and Allied Disorders" before the Dauphin County Medical Society, December 1, in Harrisburg.——Dr. Walter I. Lillie, Philadelphia, discussed "Vascular Changes in Hypertensive Disease" before the Reading Eye, Ear, Nose and Throat Society, November 18.

Philadelphia

Special Lectures.—Dr. Stanhope Bayne-Jones, professor of bacteriology, Yale University School of Medicine, New Haven, Conn., and colonel in the medical corps of the army, will lecture before the College of Physicians of Philadelphia and the Philadelphia County Medical Society, January 13, on "Tetanus." Dr. Paul C. Colonna, professor of orthopedic surgery, University of Pennsylvania School of Medicine, will deliver the Nathan Lewis Hatfield Lecture before a joint meeting of the College of Physicians and the county medical society, February 3. His subject will be "The Role of Surgery in the Chronic Arthritic Patient."

TEXAS

Annual Registration Due January 1.—Every practitioner of medicine and surgery holding a license to practice in Texas is required by law to register annually on or before January 1, with the state board of medical examiners, and at that time to pay a fee of $2. If a practitioner fails to renew his registration within sixty days after January 1, his license is suspended.

GENERAL

Medal Awarded to Sister Kenny.—Sister Elizabeth Kenny, who has established her headquarters in Minneapolis, was presented with the annual medal of *Parent's Magazine*, awarded for outstanding service to children.

Bacteriologists Cancel Meeting.—The annual session of the Society of American Bacteriologists scheduled to be held in Columbus, Ohio, December 28-30, has been canceled at the request of the Office of Defense Transportation and the science committee of the National Resources Planning Board. The council will consider the possibilities for a meeting in 1943, it was stated. The program for the canceled meeting has been printed and will be sent to members. Abstracts of the papers which were to be presented at the meeting this year will be printed in the January number of the *Journal of Bacteriology*.

Urology Award.—The American Urological Association offers an annual award "not to exceed $500" for any essay (or essays) on the result of some specific clinical or laboratory research in urology. The amount of the prize is based on the merits of the work presented, and, if the committee on scientific research deems none of the offerings worthy, no award will be made. Competitors shall be limited to residents in urology in recognized hospitals and to urologists who have been in such specific practice for not more than five years. The selected essay will appear on the program of the forthcoming meeting of the association, May 31-June 3, at the Hotel Jefferson, St. Louis. Essays must be in the hands of the secretary, Dr. Thomas D. Moore, 899 Madison Avenue, Memphis, Tenn., on or before March 1, 1943.

Prize for Work on Glaucoma.—The National Society for the Prevention of Blindness announces that a prize of $250 will be awarded for the most valuable original paper during 1943 adding to the existing knowledge about the diagnosis of early glaucoma. The award will be made by the society with the guidance of an ophthalmologic committee composed of Drs. Arnold Knapp, Manuel Uribe Troncoso and Mark J. Schoenberg, all of New York. Papers may be presented by any ophthalmologist, student in ophthalmology or research worker of the western hemisphere and may be written in English, French, German, Italian, Spanish or Portuguese, but those written in the last four named languages should be accompanied by a translation in English. Papers should be in the office of the National Society for the Prevention of Blindness, 1790 Broadway, New York, by September 15.

Special Society Elections.—Dr. Felix J. Underwood, Jackson, Miss., was chosen president-elect of the American Public Health Association at its recent meeting in St. Louis and Dr. Allen W. Freeman, Baltimore, was installed as president. Dr. Reginald M. Atwater, New York, is the secretary. ——Dr. Franklin P. Gengenbach, Denver, was named president-elect of the American Academy of Pediatrics at its meeting in Chicago in November and Dr. Borden S. Veeder, St. Louis, was inducted into the presidency. Dr. Clifford G. Grulee, Evanston, Ill., is the secretary. The academy will not hold a meeting in 1943.——Col. Lucius A. Salisbury, M. C., U. S. Army (National Guard), New York, was chosen president-elect of the Association of Military Surgeons of the United States at its annual meeting in San Antonio, Texas, November 7, and Captain William L. Mann, medical director, U. S. Navy, Washington, D. C., was installed as president. Col. James M. Phalen, M. C., U. S. Army, retired, Army Medical Museum, Washington, D. C., is the secretary.

Jacobi Fellowship Available.—The Women's Medical Association of New York offers a Mary Putnam Jacobi Fellowship for medical research of $1,000, available Oct. 1, 1943. It is open to any woman doctor, American or foreign, who is a graduate of a reputable medical school. Applications must be filed with the secretary of the committee by March 1 and must be accompanied by statements of persons other than the candidate as to health, educational qualifications and previous work. The applicant herself should state the problem she proposes to investigate and send her photograph. As it is not practicable for the secretary to write for letters about candidates, applicants should send with their applications sufficient data to enable the committee to judge of their respective merits. The recipient of the fellowship will be expected to give full time to the study of her problem and to make a report for publication at the completion of her research. Application blanks may be obtained from the secretary of the committee, Dr. Phebe L. Du Bois, 150 East 73d Street, New York.

Association for Advancement of Science.—The one hundred and eleventh meeting of the American Association for the Advancement of Science will be held in New York December 28-January 2. Registration will be at the Commodore, Pennsylvania, Edison and Henry Hudson hotels. Irving Langmuir, Sc.D., associate director of the Research Laboratory of the General Electric Company, Schenectady, N. Y., will deliver his address as retiring president Monday evening, December 28. On Tuesday John T. Tate, Ph.D., dean of the College of Science, Literature and Art and director of the university college, University of Minnesota, Minneapolis, will deliver the twenty-first annual lecture under the joint auspices of the association and the society of Sigma Xi on "Scientists in War and Peace." In addition to the fifteen sections of the association, about forty-four affiliated and associated societies and other cooperating organizations will participate in the session. The Section on Medical Sciences will meet December 28-30. One session will be devoted to a symposium on "Carbohydrate Metabolism," under the auspices of the section and the New York Section of the Society for Experimental Biology and Medicine. Two sessions on tropical medicine will be jointly sponsored by the section on medicine, the American Society of Parasitologists, the National Malaria Society, the American Society of Tropical Medicine and the New York Society of Tropical Medicine. At the first session, papers will be presented by Col. James S. Simmons, M. C., U. S. Army, Office of the Surgeon General; Col. Richard P. Strong, M. C., U. S. Army; Lieut. Col. Thomas T. Mackie, M. C., U. S. Army, and Dr. Alan Gregg, New York. Arthur H. Compton, LL.D., Chicago, president of the association, will present the fifth Theobald Smith Award at the conclusion of this session. At the second meeting the speakers will be Col. George R. Callender, M. C., U. S. Army; Malcolm H. Soule, Sc.D., Ann Arbor, Mich.; Dr. Lowell T. Coggeshall, Ann Arbor, and Dr. Wilbur A. Sawyer, New York. After this session, Dr. Wade W. Oliver, Brooklyn, vice president of the association for the Section on Medical Sciences, will deliver his retiring address on "The Man Who Lived for Tomorrow." On Tuesday evening, the medical section will joint with the New York Society of Tropical Medicine for the presentation of the Theobald Smith Lecture by Dr. M. Ruiz Castañeda, Hospital General Departamento de Investigaciones Médicas, Mexico. Included among the speakers at the final session of the section on Wednesday will be Drs. Charles C. Macklin, London, Ont., Canada; Walter S. Hartroft, London, Ont.; Eric Miles Atkinson, New York; Benjamin Karpman, Washington, D. C.; Harry Eagle, Baltimore, and Edward C. Rosenow, Rochester, Minn., and Jesse P. Greenstein, Ph.D., Bethesda, Md.

The U. S. Public Health Service will sponsor a symposium on "Drug Intoxication and Drug Addiction," which will be presented at six sessions to be held on Monday, Tuesday and Wednesday. One session will be devoted to "Barbiturates, Bromides and Chloral," one to "Cocaine, Marihuana and Peyote," and four to "The Opiates." The symposium will close with a public meeting Wednesday afternoon at which Dr. Thomas Parran, surgeon general, U. S. Public Health Service, will introduce Dr. Lawrence Kolb, assistant surgeon general, division of mental hygiene of the service, who will deliver an address entitled "Drug Addiction as a Public Health Problem."

The Section on Agriculture and the American Society for Horticultural Science will present a joint symposium on nutrition, December 30, with the following speakers: Leonard A. Maynard, Ph.D., New York; Conrad A. Elvehjem, Ph.D., Madison, Wis.; Richard Bradfield, Ph.D., Ithaca, N. Y.; John R. Magness, Ph.D., Bureau of Plant Industry, U. S. Department of Agriculture, Beltsville, Md., and Lydia J. Roberts, Ph.D., Chicago. The American Science Teachers Association will meet December 30. At the sessions of the American Association of Scientific Workers, December 29-30, the speakers will include Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, on "Medicine in the Armed Forces and on the Home Front." Another feature will be a program on "War Science in the United Nations."

CORRECTION

Panel Discussion on Ulcer.—In the Abstract of Question Period following the Panel Discussion on Ulcer beginning on page 824 in THE JOURNAL, November 14, Dr. Asher Winkelstein desires to make the following corrections in some of his discussions. Dr. Winkelstein says that in his second discussion "intradigestive" should read "interdigestive"; his third discussion should read "milk drip form of therapy" instead of "milk form of therapy"; his fourth discussion should read "reduced" instead of "produced," "milk" should be inserted before "bicarbonate," and following "phosphate" should be inserted "to *p*H 3.5," and "from 6.50 to" should be omitted; in his fifth discussion the "h" should be deleted from Dr. Berg's name, "not" should be omitted before the word "cut," "subphrenic anterior" should be used instead of "subanterior," and finally "which may lead to harmful procedures in the abdomen" should be omitted.

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Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 7, 1942.

Medical Aid in New Guinea

A medical officer in the Australian forces who spent several weeks in the front line in New Guinea, until his leg was shattered by a Japanese bullet, has given a vivid picture of medical conditions in the Owen Stanley range. The troops, having no tents, slept in the open or under shelters of thatch made by the natives. They were always wet. The sun shone for a few hours every morning but rain fell in torrents every afternoon. The men lived on biscuits, bully beef and water. They had tea but could not boil water, as flames at night or smoke by day would give away their positions to the enemy. They were nearly always hungry. Fortunately there were no mosquitoes in the highlands and thus there was little malaria and no dengue. Most of the wounds were caused by rifle or machine gun fire and a few by mortar fire. The doctors were very short of drugs. All supplies had to be brought to the front line by porters, and preference was given to ammunition and food over medical supplies.

The regimental aid-post at first had no tents, but the medical officer managed to get three two-men tents to cover the worst cases. Twice the Japanese fired through the tents, once when the medical officer was in the middle of an amputation. The wounded were wounded again as they lay in the tents. Light casualties had to walk along the trail. Severe casualties were carried on stretchers by Papuan boys, usually six to one stretcher, but on difficult terrain ten or more were required. The medical officer praises the work done by these boys as "beyond all description."

Live Shell Removed from a Man's Thigh

In a recent speech Dr. Donald Hall, chairman of the Royal County Hospital, told of a man brought to the hospital with a thigh injured during a recent air raid. Under the wound of entry a sharp pointed object could be felt. At the time of injury the enemy had dropped all their bombs and were headed home with their guns blazing. It was decided that the object therefore was not a bomb fragment and was thought possibly to be part of a fractured femur. X-ray examination, however, revealed that an unexploded cannon shell was embedded in the tissues. The bomb disposal unit was called and the officer identified the shell from the roentgenogram as of the armor piercing variety which explodes on impact. What was to be done? If the shell exploded, at best the man would lose his leg, which would be shattered; very likely he would lose his life. If the shell exploded during the operation for its extraction, the surgeon and every one in the operating room ran great risks, especially for loss of eyesight. The removal was necessary, danger or no danger. The patient was left in blissful ignorance and the surgeon, his assistant, the anesthetist and the nurses got to work. Swiftly and successfully the surgeon performed the most delicate and dangerous operation of his career and removed the shell. Within half an hour of leaving the ward the patient was back in bed. The name of the surgeon was not revealed. During the operation, according to this report, an assistant surgeon appeared at the door of the operating room to inquire what were his prospects for promotion to the senior staff!

Training the Limbless to Return to a Full Life

This greatest of wars involves an enormous loss of limbs as well as of lives. At a meeting held at the Mansion House under the presidency of the lord mayor, Mr. Bevin, minister of labor, spoke on the employment of limbless persons injured in the war. The employment on full wages of an ex-soldier so injured should be regarded not as a virtue but as a duty and honor. The government had determined to establish a national rehabilitation scheme, which would be one of the greatest social services ever established in this country. They would provide training for any citizen who was injured.

Sir Walter Wormsley, minister of pensions, said that there had been enormous improvements in the artificial limbs issued. American visitors to Roehampton Hospital had declared that we were even ahead of the United States.

Mr. R. Langdale Kelham, chief limb surgeon to Roehampton Hospital, said that the greatest obstacle to a return to normal life was the idea that a patient who had lost his leg was necessarily a cripple. He asked the meeting to note the normal appearance, gait, activity and expression of those whom he asked to walk across the platform. The first was a lieutenant commander, still serving in the Navy, whose leg had been amputated below the knee. Then came 5 others who had undergone the same operation. Among them was a schoolgirl injured in an air raid and now back at her work. She could walk, run, skip and ride a bicycle.

New Scheme for Treatment of Tuberculosis

In the House of Commons Mr. E. Brown, minister of health, announced a new scheme for the treatment of tuberculosis based on a report by a committee appointed by the Medical Research Council at his request. To facilitate early diagnosis, he has obtained priority for the supply of some thirty sets of equipment for mass roentgenography, which will be allocated to the large centers of population where they can be used to the best advantage. Training of the necessary expert staff has been arranged. The extended arrangements will need additional beds in sanatoriums, which have been arranged for. Immediate needs in regard to trained nurses can be met only by better distribution. It is important that those who give up their work temporarily to be treated under the new scheme should, no less in their own interest than in that of the public health, be able to do so without anxiety as to the maintenance of their dependents. Local authorities are therefore being authorized to grant financial assistance in such cases to provide for the maintenance of the dependents and avoid the break-up of the home while the breadwinner is under treatment.

Fatigue Fracture of the Tibia

The curious condition of fatigue fracture of the tibia appears to have been first described only three years ago by Roberts and Vogt (*J. Bone & Joint Surg.* **21**:891 [Oct.] 1939). In the *British Journal of Surgery* for July (which is late in publication because after it had gone to press the whole of the type and the illustrations were destroyed by enemy action and had to be replaced) J. Blair Hartley reports as many as 14 cases. This indicates that the condition is not so rare as might be supposed and must have been overlooked in the past until attention was drawn to it. Generally there is no history of injury and certainly none of violence likely to cause a fracture. The only constant symptom is pain on standing, on walking or after walking. This may be behind the knee or over the inner aspect of the upper third of the tibia. In 5 of Hartley's patients slight swelling could be detected on the inner aspect of the upper end of the shaft of the tibia. The condition always occurs in children or adolescents. The oldest patient in Hartley's series was 20 years of age. The average age was 3 years; in Roberts and Vogt's series it was 10.9 years. Radiologically the lesion is 1½ to 3¼ inches below the epiphysial line, depending on the age and height of the patient. There is always callus, usually on the inner aspect, occasionally on the outer. The early changes may be overlooked unless the roentgenograms are faultless. In the early cases a tiny nick is seen in the cortex of the tibia, either medially or laterally or both. In the lateral view there is seen beyond the cortex

posteriorly a tiny mass of callus. Later, extending forward horizontally within the tibia from the callus is seen an area of osteoporosis or, in a mild case, an ill defined zone of osteosclerosis. Under rest the callus increases and the osteoporosis is replaced by dense bone, the callus becomes organized and in the ensuing months gradual repair occurs.

No case in Hartley's series which has been treated by immobilization failed to progress to cure. Investigation should be made for causes of abnormal stress and strain. There is evidence that the affected area of the tibia is subject to a good deal of strain. Hartley's belief is that the condition is a fatigue fracture due either to faulty structure of the bone at the area of maximum strain or to abnormal strain at a site already subject to considerable stress. There is similarity to march fracture of the metatarsals both in radiologic appearance and in rate and method of healing. It is essentially a "fatigue dystrophy" such as has been described by Prof. Karl Henschen of Basle. It is definitely not due to infection.

Britain's War Effort

Mr. Bevin, minister of labor, has described in a broadcast Britain's war effort in production. Out of 33 million people in Great Britain between the ages of 14 and 65 years we mobilized for service more than 23½ millions of men and women, who were now on full time work for the nation in one capacity or another. There were also great numbers rendering voluntary service. When an account was taken of these there were left something less than 3 millions, which included children, the sick, crippled and aged. But we must measure our mobilization not only in numbers but also in terms of the energy exerted. For more than three years great numbers of our factory workers have been toiling between sixty and seventy hours a week and today are working on the average fifty-six hours. The British people had consented to the highest mobilization of any nation in the world at this moment. Taxation that would seem unbelievable in peacetime had been cheerfully accepted to pay for the struggle. For the same purpose and in the same spirit people had stinted themselves and lent the state in small savings $800,000,000.

Food Rationing for Diabetic Patients

Early in the war the government appointed a committee of experts to consider what modification of the rationing system would be necessary for invalids, and particularly for diabetic patients. Those not on insulin could not, like normal persons, substitute more carbohydrate foods, bread, potatoes and the like for the restricted protein and fat. Patients on insulin were in a better position because they could increase the dosage, if necessary, to compensate for less protein and fat. However, no distinction was made between the two groups, and it was decided that all diabetic patients by giving up their sugar could obtain extra protein, in the form of meat, and fat rations on producing a doctor's certificate. Subsequently extra cheese (12 ounces a week, later increased to 16 ounces) was granted and extra milk (1 pint daily) could be prescribed. Two extra fat rations of 6 ounces a week of butter or margarine are allowed, making a weekly total of 18 ounces of butter or margarine and 2 ounces of cooking fat. The protein ration scheme amounts to 40 ounces of meat, 12 ounces of cheese, 4 ounces of bacon and up to 7 pints of milk weekly. In addition, there are occasional eggs, fish and poultry. Thus the animal protein allowance is very liberal.

Diabetic patients threatened with ketosis suffer from nausea and vomiting and may be unable to take their usual diet. They must take carbohydrate to balance their insulin. As sugar and sugared drinks are usually the best form in which to take carbohydrate, an emergency supply can be obtained on presenting a medical certificate at the local food office. One and one-half pounds is allowed at once in exchange for the meat, bacon, fat and cheese coupons for the next week.

Indian War Casualties

At the Indian council of state, held at Delhi, the government spokesman stated that Indian war casualties up to September 23 numbered about 100,000 and were made up of 2,096 killed, 8,521 wounded, 2,938 prisoners and 84,833 missing. The missing were those about whom the government had no information that they were prisoners. Some 70,000 were still untraced in Malaya and the Far East generally and about 12,000 in Libya.

BRAZIL

(From Our Regular Correspondent)

Oct. 15, 1942.

Brief Items

Dr. J. Moreira da Fonseca, professor of medicine at the University of Rio de Janeiro, has been elected president of the National Academy of Medicine. Professor Moreira da Fonseca is well known for his studies on the reticuloendothelial system, particularly in tropical diseases.

The National Academy of Medicine held a special meeting to honor the memory of Dr. Francisco Fajardo, a physician of Rio de Janeiro who died in 1907 from anaphylactic shock after the second injection of a mixture of antiplague serum and vaccine. Dr. Fajardo was a pioneer in bacteriology, parasitology and tropical medicine in Brazil. He founded in 1895 the bacteriologic laboratory of the health department of Rio de Janeiro and began the study of Brazilian mosquitoes, the description of which was published in medical periodicals of Great Britain and Germany. Theobald of the British Museum of London honored Dr. Fajardo by giving two new species of mosquitoes his name (Stegomyia fajardoi and Culex fajardoi).

The first Brazilian Congress for the Prevention of Blindness was held from July 1 to 4 in this city. Many contributions regarding the subjects of good illumination and eye hygiene were presented. A feature of the congress was the presence of Dr. Matthew Luckiesh of the General Electric Laboratories of the United States, who read a paper on "Light and Vision."

The Brazilian army medical corps has organized an emergency course of military medicine which is being given in connection with the medical school of the University of Rio de Janeiro. Surg. Gen. Dr. Souza Ferreira has appointed Col. Dr. E. Marques Porto to act as director of the course. The training work has just begun, with a registration of two hundred and seventy physicians. A second group of physicians is being organized, to begin the training work in August.

Deaths

Dr. Pedro Ernesto, a noted surgeon and founder of the Pedro Ernesto Hospital, died at the age of 58. Dr. Pedro Ernesto was mayor of Rio de Janeiro from 1931 to 1935. He visited the United States a few months ago.

Marriages

Ralph Joseph Ragosta, Brooklyn, to Miss Aline Margaret Baldwin at Alexandria, La., September 16.

Donald Vincent Hirst, Durham, N. C., to Miss Katherine Louise Binder at Leonia, N. J., June 28.

James W. Agnew, Iowa City, to Miss Alice Marie Kline of Knoxville in Cedar Rapids, July 21.

Richard E. H. Phelps, State Center, Iowa, to Miss Priscilla Imlay of Black Earth, Wis., July 24.

Claude B. Rogers to Miss Madeline Seger, both of Earlville, Iowa, at Nashua, July 29.

Samuel Maudbin Wells to Miss Helena Gertrude Bengston, both of Minneapolis, July 18.

Herman B. Katzman to Miss Florence C. Kahan, both of Brooklyn, June 28.

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Deaths

Reuben Peterson ● Duxbury, Mass.; Harvard Medical School, Boston, 1889; in general practice at Grand Rapids, Mich., from 1890 to 1898; became associated with the University of Michigan Medical School, Ann Arbor, in 1901 as professor of obstetrics and gynecology, the fourth man to head that department since the founding of the university in 1850, a position he filled until 1931, when he retired with the title of emeritus professor; professor of gynecology at the Post-Graduate Medical School of Chicago from 1898 to 1901, carrying a concurrent appointment as assistant professor of obstetrics and gynecology at Rush Medical College, Chicago; secretary of the Section on Obstetrics and Diseases of Women, 1895-1896, chairman of the Section on Obstetrics, Gynecology and Abdominal Surgery, 1919-1920, and member of the House of Delegates in 1907 and in 1919 of the American Medical Association; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; one of the founders and a fellow of the American College of Surgeons; president in 1911, fellow from 1897 to 1931 and since then honorary fellow of the American Gynecological Society; honorary fellow of the Detroit Obstetrical and Gynecological Society and the Edinburgh Obstetrical Society; honorary fellow of the Washtenaw County Medical Society and president in 1902; honorary fellow of the Michigan State Medical Society and president in 1915; served as a major in the medical corps of the U. S. Army during World War I; medical director of the University Hospital, Ann Arbor, from 1912 to 1918; at one time medical director and owner of the Ann Arbor Private Hospital; served as medical adviser to the governor of Michigan from 1917 to 1919; formerly a member of the board of health of Ann Arbor; received the honorary doctor of science degree from the University of Michigan in 1936; in 1931 his portrait was presented to the University of Michigan by a group of his former assistants; editor of "Peterson's Obstetrics" a volume published in 1907; author of "A Manual for a Demonstration Course in Obstetrics," first edition published in 1930 and second edition published in 1937; aged 80; died, November 25.

Le Roy Augustus Wilkes ● Trenton, N. J.; University of Pennsylvania School of Medicine, Philadelphia, 1910; appointed executive officer of the Medical Society of New Jersey in 1933; member of the American Public Health Association, the American Academy of Pediatrics; on the executive committee of the New Jersey Health and Sanitary Association; on the executive board of the New Jersey Welfare Council and of the New Jersey and Mercer County Tuberculosis Leagues; specialist certified by the American Board of Pediatrics, Inc.; formerly practiced pediatrics in Philadelphia, where he was a medical school inspector, had been connected with the University, Children's, Polyclinic and Presbyterian hospitals and was attending pediatrician to the Pennsylvania State Tuberculosis Dispensary number 17 from 1912 to 1917; from 1917 to 1920 director of the child hygiene division of the Bridgeport (Conn.) Department of Health, an appointment by the U. S. Public Health Service; medical director of the Trenton (N. J.) Board of Education from 1920 to 1923; during 1923 and 1925 he was in Austria and Germany, at which time he was medical director of the Austrian Child Health Program of the Commonwealth Fund of New York; was director of the student health services of the University of Texas, Austin, 1926-1927; director of medical service of the American Child Health Association from 1927 to 1933; acting editor of the *Journal of the Medical Society of New Jersey;* aged 59; died suddenly, November 29, of cerebral hemorrhage.

Howard Clinton Frontz ● Huntingdon, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1894; an Affiliate Fellow of the American Medical Association and member of the House of Delegates from 1930 to 1939; member of the American Public Health Association; past president of the Medical Society of the State of Pennsylvania, and the Pennsylvania Public Health Association; past president and secretary of the Huntingdon County Medical Society; fellow of the American College of Surgeons; member of the advisory health board of the Pennsylvania Department of Health from 1923 to 1931; medical director of Huntingdon County from 1908 to 1925; physician from 1895 to 1908, consulting physician from 1908 to 1923 and vice president of the board of trustees from 1923 to 1931, Pennsylvania Industrial Reformatory; for many years surgeon and trustee of the J. C. Blair Memorial Hospital; surgeon for several railroads and numerous industrial plants; aged 71; died, October 29, in the Friends Hospital, Philadelphia, of arteriosclerotic heart disease.

William Edward Fairfield, Green Bay, Wis.; University of Bishop College Faculty of Medicine, Montreal, Que., Canada, 1887; fellow of the American College of Surgeons; served as a captain in the medical corps of the U. S. Army during World War I; for many years a member of the hospital board and president of the medical staff of St. Mary's Hospital; surgeon to St. Vincent's Hospital; with Dr. W. H. Bartran established the Fairfield-Bartran Clinic; aged 80; died, October 18, of epithelioma of the face.

Frederick Bryton Little, Norristown, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1915; member of the Medical Society of the State of Pennsylvania; served in the medical corps of the U. S. Army during World War I and received citations from the English and Russian governments; aged 52; member of the board of directors of the Riverview Hospital; on the staff of the Montgomery Hospital, where he died, October 31, of cerebral hemorrhage.

James Craig Strong ● Leadville, Colo.; University of Nashville (Tenn.) Medical Department, 1900; Kentucky School of Medicine, Louisville, 1903; member of the American Academy of Ophthalmology and Otolaryngology; president and formerly secretary of the Lake County Medical Society; at one time secretary of St. Francis (Ark.) Medical Society; on the staff of St. Vincent Hospital; aged 64; died, October 14, of coronary thrombosis.

William John Jones, Tacoma, Wash.; University of Oregon Medical School, Portland, 1915; member of the Washington State Medical Association; fellow of the American College of Surgeons; served during World War I; coroner of King County from 1926 to 1934; formerly member of the staffs of St. Luke's, Providence, Swedish and King County hospitals, Seattle; aged 56; died, October 25, at American Lake.

Gardner Rich Ridlon ● Seattle; Columbia University College of Physicians and Surgeons, New York, 1925; specialist certified by the American Board of Urology, Inc.; member of the American Urological Association; on the staffs of the Providence Hospital and the Firland Sanatorium; aged 43; died suddenly while on a hunting trip just outside of Ellensburg, November 1.

James Ross Mosogrove ● Steubenville, Ohio; University of Pennsylvania Department of Medicine, Philadelphia, 1897; at one time secretary of the Jefferson County Medical Society; formerly served on the board of education; on the staffs of the Ohio Valley and Gill Memorial hospitals; aged 67; died, October 28, of cerebral arteriosclerosis and diabetes mellitus.

Charles Given Foote, San Diego, Calif.; University of Wooster Medical Department, Cleveland, 1895; member of the American Urological Association; formerly associate professor of genitourinary diseases at the Cleveland College of Physicians and Surgeons; at one time on the staff of the City Hospital, Cleveland; aged 69; died, October 22.

William B. Linton ● Minneapolis; Jefferson Medical College of Philadelphia, 1886; an Affiliate Fellow of the American Medical Association; formerly on the staff of the Rochester (Minn.) State Hospital; aged 86; died, September 13, in the Eitel Hospital of cerebral hemorrhage with right hemiplegia and carcinoma of the prostate.

Thomas Augustine O'Brien, New Haven, Conn.; Yale University School of Medicine, New Haven, 1902; served as a first lieutenant in the medical corps of the U. S. Army during World War I; formerly clinical assistant at his alma mater; served as assistant surgeon at the Hospital of St. Raphael; aged 63; died, October 24.

William Pickens Harbin Sr. ● Rome, Ga.; Bellevue Hospital Medical College, New York, 1897; fellow of the American College of Surgeons; formerly member of the board of trustees of the Shorter College; aged 70; co-founder and on the attending staff of the Harbin Hospital, where he died, November 4.

Almon H. Lyman, Fillmore, N. Y.; University of Buffalo School of Medicine, 1884; University of Pennsylvania Department of Medicine, Philadelphia, 1895; member of the Medical Society of the State of New York; medical superintendent of the Genesee Country Memorial Hospital; aged 80; died, October 22.

Martha Hayward, Aurora, Ill.; Colorado School of Medicine, Boulder, 1906; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; at one time superintendent of the Aurora Hospital; aged 74; died, October 30, in the Copley Hospital of cerebral hemorrhage.

Ernest Linwood Cheney, Duluth, Minn.; Harvard Medical School Boston, 1900; member of the Minnesota State Medical Association; for many years associated with the U. S. Public

Health Service; aged 65; died, October 30, in St. Luke's Hospital of myocardial insufficiency and pulmonary embolism.

John Marion McFarling ● Shawnee, Okla.; University of Oklahoma School of Medicine, Oklahoma City, 1935; formerly secretary of the Pottawatomie County Medical Society; secretary of the staff of the Shawnee Municipal Hospital; aged 39; died suddenly, October 27, of coronary occlusion.

Andreas Pederson Lommen, Lanesboro, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1895; served during World War I; aged 75; died, September 16, in the Veterans Administration Facility, Milwaukee, of cerebral thrombosis.

John Witt de Vebre ● Ronceverte, W. Va.; University of Maryland School of Medicine, Baltimore, 1886; formerly secretary of the Greenbrier Valley Medical Society; fellow of the American College of Surgeons; aged 80; died, October 28, of coronary thrombosis.

Preston David Geiger ● Providence, R. I.; Hahnemann Medical College and Hospital of Philadelphia, 1925; member of the New England Pediatric Society; head of the pediatric department, Homeopathic Hospital; aged 43; died, October 24, of coronary thrombosis.

Frederick James Cunningham Smith ● Ardmore, Okla.; Harvard Medical School, Boston, 1932; a diplomate of the National Board of Medical Examiners; appointed a first lieutenant in the medical reserve corps of the U. S. Army Feb. 13, 1941 and promoted to captain in March 1942; aged 35; was killed during a bombing raid on New Guinea, September 9.

Gamble Morris O'Malley, Weimar, Calif.; Long Island College Hospital, Brooklyn, 1896; on the staff of the Weimar Joint Sanatorium; aged 67; died, October 9, at St. Francis Hospital, San Francisco, of chronic nephritis with uremia.

Homer Alphonzo Gilliam ● Mayfield, Ky.; University of Louisville (Ky.) Medical Department, 1909; aged 58; one of the founders and president of the Fuller-Gilliam Hospital, where he died, November 4, of coronary occlusion.

John C. Hoover ● Owensboro, Ky.; College of Physicians and Surgeons of Chicago, 1883; fellow of the American College of Surgeons; on the staff of the Owensboro City Hospital; aged 80; died, October 30, of cardiorenal disease.

Landon Hayes Gammon, Bristol, Tenn.; University of Maryland School of Medicine, Baltimore, 1892; formerly mayor of Bristol; aged 81; died, October 30, of arteriosclerotic heart disease and hypertension.

KILLED IN ACTION

CAPTAIN FREDERICK J. C. SMITH, M. C., A. U. S., 1907-1942

David Jacobs Kutcher, Pattonville, Mo.; University of Moscow Faculty of Medicine, Russia, 1916; resident physician, Jewish Sanatorium, Robertson; aged 56; died suddenly, October 26, of pulmonary embolism.

Fergus Joseph McDonough, Brooklyn; Long Island College Hospital, Brooklyn, 1899; member of the Medical Society of the State of New York; aged 78; died, October 30, of acute cardiac decompensation.

Charles Martin Matter ● Chicago; Northwestern University Medical School, Chicago, 1898; at one time on the staffs of the Evangelical and Wesley Memorial hospitals; aged 67; died, November 7.

Edward E. Woodside, Marion, Ill.; Rush Medical College, Chicago, 1905; member of the Illinois State Medical Society; aged 66; died, October 24, in the Herrin (Ill.) Hospital of cerebral hemorrhage.

James Henry Frey, Clarksville, Tenn.; University of Tennessee Medical Department, Nashville, 1894; member of the medical reserve corps during World War I; aged 72; died, November 4.

Johnson Nichols McCartney, Maitland, Fla., Hahnemann Medical College and Hospital, Chicago, 1897; served overseas during World War I; aged 69; died, October 24, of cerebral hemorrhage.

Philip Simerman, New York; Long Island College Hospital, Brooklyn, 1912; member of the Medical Society of the State of New York; aged 53; died, October 23, of coronary thrombosis.

Edward William Wiles, Des Moines, Iowa; Detroit College of Medicine, 1911; physician for the Girls Training School, Mitchellville; aged 54; died suddenly, November 3, of coronary thrombosis.

Charles E. Vance, Middletown, Ohio; Starling Medical College, Columbus, 1883; aged 84; died, October 16, in the Middletown Hospital of extensive carcinoma of the liver and stomach.

Lewis K. Maxwell, Toledo, Ohio; Homeopathic Hospital College, Cleveland, 1883; a member of the staffs of the Mercy and the Toledo hospitals; aged 85; hanged himself, October 29.

Carl Shuey Owen ● National City, Calif.; Northwestern University Medical School, Chicago, 1904; attending physician and part owner of the Elwyn Hospital; aged 64; died recently.

Edward Brandon Newsom, Rockwood, Texas; University of Texas School of Medicine, Galveston, 1897; aged 75; died, October 26, in the John Sealy Hospital, Galveston.

Charles A. Lumsden, De Witt, Ark.; University of Arkansas School of Medicine, Little Rock, 1912; member of the Arkansas Medical Society; aged 64; died, October 27.

William Zeller Kumler, Hamilton, Ohio; Homeopathic Hospital College, Cleveland, 1885; aged 82; died, October 14, in the Fort Hamilton Hospital of cerebral embolism.

Harold Bonaventure Fear ● Freeland, Pa.; Georgetown University School of Medicine, Washington, D. C., 1933; aged 35; died, October 22, of carcinoma of the stomach.

Elmer Julius Eklund ● Norwood, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1907; aged 57; died, October 28, of coronary occlusion.

W. Muldrow Brockinton, Manning, S. C.; Medical College of the State of South Carolina, Charleston, 1887; aged 76; died, October 16, of a self-inflicted gunshot wound.

Sallie V. Rutledge Johnson, Lancaster, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1929; aged 44; died, October 29, of poison, self administered.

Lee Clanton, Rockford, Wash.; Ensworth Medical College, St. Joseph, Mo., 1906; aged 67; was found dead in his automobile, October 21, of coronary heart disease.

Gilman Erastus Baldwin, Jay, N. Y.; University of Vermont College of Medicine, Burlington, 1873; aged 92; died, October 17, of myocardial degeneration.

William P. Shelly, Albany, Ga.; Louisville (Ky.) Medical College, 1878; member of the Medical Association of Georgia; aged 86; died, October 23, of jaundice.

Millie J. Heilman, St. Louis; American Medical College, St. Louis, 1894; aged 81; died, November 2, at the Lutheran Convalescent Home of pneumonia.

Henry Warren Johnson, Altadena, Calif.; Boston University School of Medicine, 1888; aged 86; died, October 19, of perforated ulcer of the stomach.

Leslie Handlin George, Haverhill, Mass.; Maryland Medical College, Baltimore, 1905; aged 63; died suddenly, October 22, of coronary thrombosis.

B. Du Bois Buxton, Mount Gilead, Ohio; Eclectic Medical Institute, Cincinnati, 1871; aged 93; died, October 29, of arteriosclerosis and prostatism.

Elbridge Tidrick Likes, Des Moines, Iowa; Detroit Medical College, 1875; aged 90; died, October 15, in the Mercy Hospital of myocarditis.

George Lee Withers, Davidson, N. C.; North Carolina Medical College, Charlotte, 1914; aged 60; died, October 20, of cardiorenal disease.

M. H. Roberts, Greenwood, Miss.; Memphis (Tenn.) Hospital Medical College, 1901; aged 76; died, October 13, of abscessed liver.

James Hiram Bindley, San Antonio, Texas; Cincinnati College of Medicine and Surgery, 1893; aged 71; died, October 31.

Walter Perry Thorp, Clearfield, Pa.; Baltimore Medical College, 1905; aged 68; died, October 19, of mitral stenosis.

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Bureau of Investigation

SOME MISCELLANEOUS MEDICAL FRAUDS

A Variety of Schemes Debarred from the Mails

Fraud orders issued by the Post Office Department have frequently been the subject of extensive articles by the Bureau of Investigation in these pages of THE JOURNAL. Following are brief abstracts of some fraud orders not dealt with previously:

George Glass.—From Fairy Hill, Saskatchewan, Canada, this person advertised that for 50 cents he would send a "recipe" for "Nature's Scientific Method for Growing Hair and Cure for Baldness." The word "Cure" became "Relief" in the instructions which came with the treatment and which went on to say: "Young persons who have lost their hair after fevers the washing of the head with cold water is helpful. Against the early falling out of the hair without any cause or weakening disease [sic] I recommend the following Hair Pomade: Cold prepared chinacstract, 4 grams, lard, 30 grams, bitter almond oil, 50 drops. Mix everything thoroughly together and take teaspoonful and rub it on the bald spots of the hair every evening." Glass then went on to suggest "another natural hair restorative . . . add ½ ounce of the oil of mace to ¾ of a pint of deodorized alcohol; pour a spoonful or two into a saucer, dip a small, stiff brush into it, and brush the hair smoothly, rubbing the tincture well into the roots . . . Bathing the head in a strong solution of rock salt is said to benefit gray hair in some instances . . . A good wash for the hair is 1 teaspoonful of ammonia to a quart of warm water." Medical evidence assembled by the United States Post Office showed that baldness is due to many causes both local and systemic, such as fever, tuberculosis, diabetes, venereal diseases, glandular disorders and chronic debilitating conditions which cause emaciation and anemia; that baldness also may be attributable to heredity or senility, and that such local ailments as ringworm, seborrhea, psoriasis and other scalp troubles may cause temporary or permanent baldness. As to Glass's first-named method, that of washing the head with cold water, allegedly to regrow hair that has fallen out during fevers, the Post Office evidence pointed out that the restoration is due to no such treatment, as the hair almost invariably reappears with the passing of the fever. Regarding the second-named treatment, it was shown that the ingredients mentioned are well known to the medical profession as to their effects and limitations. "China extract," also known as China root, China ginger and galanga root, is a stimulant and irritant to the scalp, but lard and bitter almond oil have no effect on the skin or scalp except to soften them. Hence such a treatment would be neither "scientific" nor effective for growing hair. Glass's third method also was shown to be ineffective because, though oil of mace and alcohol are scalp stimulants to some extent, one should not expect the mixture to produce any results in baldness, which is due to many causes and conditions. Altogether, Glass's business was declared to be a scheme for obtaining money through the mails by means of false and fraudulent pretenses, representations and promises and accordingly it was debarred from the United States mails by a fraud order issued on Jan. 26, 1942 against the name George Glass.

Kimball Laboratories.—This Milwaukee concern originally operated at Minneapolis and was founded around 1920 by an H. B. Kimball who ran it until 1929, when he sold it to a John J. MacCloskey. The "laboratories" sold two treatments through the mails, one known as "Kimball Tablets" (or "Rays of Health") and "Kim's Rx. 26." According to the advertising the tablets would, among other things, "rid any person of stomach trouble, ulcers, gall bladder affections, dyspepsia, gastritis, acidosis and similar conditions." Kim's Rx. 26 was claimed to "dissolve and remove gallstones" and to be "superior to surgery" in doing so, besides overcoming liver and bladder disorders, including even "advanced" cases. According to government chemists the Kimball Tablets contained bismuth subnitrate and sodium bicarbonate, 10 grains each, magnesium carbonate, 7 grains, kaolin, 6.5 grains, calcium carbonate, 2.64 grains, papain and diastase of malt, 1 grain each, and smaller amounts of saccharin, oleoresin of ginger, pancreatin, pepsin and oil of peppermint. The directions were to crush one tablet about an hour after meals, with water or milk. Although testimonials quoted in the circular matter repeatedly stated that those who have used these tablets have been enabled to "eat anything," persons ordering them received in addition various directions as to diet, such as to "abstain from foods that have disagreed with you heretofore." At the Post Office hearing of this case as a mail order fraud the testimony of medical witnesses who appeared for the government and others representing the Kimball concern (though one of the last named admitted that he was not an expert on gastroenterology) showed that the term "stomach trouble" includes not merely hyperacidity but also ulcers and cancers of the stomach, among many other disorders and their symptoms, some of which, especially cancers and sometimes ulcers, require prompt surgery in order to save the patient's life. The testimony further brought out that lay persons suffering from stomach complaints are incapable of determining for themselves the various causes of their conditions, and that the product in question, even when taken according to directions and with the recommended accompanying diet, would not overcome the wide variety of stomach ailments cited in the Kimball advertising. Accordingly the Post Office found that the sale of this nostrum constituted a fraud on the public, as did also the sale of the other Kimball product, "Kim's Rx. No. 26," which was represented as a cure for liver disorders and gallstones. According to the Post Office it contained 1 grain each of sodium salicylate and calcium carbonate, ½ grain each of sodium taurocholate and sodium glycocholate, ⅛ grain each of cascara sagrada extract and phenolphthalein, 1/3 grain of menthol, 1/16 grain of podophyllin and some certified food color. According to the undisputed testimony of an expert medical witness for the government, "disorders of the liver" include such serious ones as cancer, cirrhosis and tuberculosis of this organ. Kim's Rx. No. 26 was included with Kimball Tablets as causes for the fraud order, which was issued Feb. 23, 1942, against the H. B. Kimball Company and its officers and agents, at Milwaukee. Still earlier, another government agency had taken action against the Kimball outfit. In November 1937 the Federal Trade Commission announced that it had ordered John J. McCloskey of Milwaukee, trading as H. B. Kimball, H. B. Kimball Company and Kimball Laboratories, to cease representing, directly or through the use of testimonials or endorsements or in any other manner, that Kimball Tablets constitute an effective remedy or cure for, or have any therapeutic value in the treatment of, stomach trouble, ulcers of the stomach, constipation, indigestion, dyspepsia and gastritis; or that the product will cure or remove the cause of gas pains, intestinal toxic conditions, acidosis, bloating after meals, and symptoms of dyspepsia; provided, however, that the concern was not to be prevented from representing the product as a palliative treatment for temporary relief of such ailments.

L. M. Gross Medicine Company.—For many years a person named L. M. Gross, at Little Rock, Ark., now reported by the Post Office Department to be an elderly negress, has been putting out a "patent medicine" under the name "G. S." This she represented as a cure for a wide range of disorders including syphilis, malaria, pellagra, rheumatism and stomach, liver and kidney diseases. In no fewer than five instances of record the Food and Drug Administration brought actions against L. M. Gross or the L. M. Gross Medicine Company for making false and fraudulent representations on the labels on G. S., also known as G. S. Remedy. In one instance the concern was fined but the other cases went by default for want of defense and the court ordered that the shipments in question be confiscated. Finally the business was investigated by the Post Office Department. In November 1941 that department served notice on T. M. Gentry, described as manager of the L. M. Gross Medicine Company and grandson of L. M. Gross, to attend a hearing on Dec. 8, 1941, and answer charges of conducting a fraud through the mails. Neither Gentry nor anyone representing him appeared at the hearing. A month later the Post Office notified Gentry by letter of the evidence that the government had presented at the hearing, and gave him an opportunity to abandon the enterprise voluntarily and thus avoid further action leading to the issuance of a fraud order against him. Gentry replied that though L. M. Gross would not consent to discontinue the business, Gentry himself would promise to cease any efforts to sell the product in question. Gentry was told that his promise was not considered a proper basis for disposing of the charges against the concern and that the prosecution must go forward unless he filed an affidavit by March 1, 1942, agreeing to abandon the scheme, but he did not so file. At the hearing of the case a government chemist testified that he had found G. S. to consist essentially of a 9.2 per cent alcohol solution containing 0.7968 grain of potassium iodide and 0.5522 grain of soluble plant material, in each hundred cubic centimeters, with mandrake also present. The government's expert medical witness testified that this mixture when taken as directed would have a laxative action and also some diuretic effect due to the potassium iodide. He also discussed the various diseases for which G. S. was advertised and showed that the nostrum would not cure them. On April 9, 1942 the Post Office issued a fraud order which closed the mails to the L. M. Gross Medicine Company and its officers and agents.

Sur-Way Electric Hair Brush Company.—This Hollywood, Calif., concern originally was known as Sur-Way Manufacturing Company and was run by an R. W. Thompson. An investigation convinced the Post Office Department that the representations in the advertising, to the effect that the Sur-Way Electric Hair Brush would produce a vigorous growth of hair on any bald head, immediately eliminate dandruff and put the scalp into a healthy condition, were false and fraudulent. Accordingly the Post Office notified Thompson to show cause on Aug. 19, 1940, why a fraud order should not be issued against him and his concern, debarring them from the further use of the mails. Instead of attending the hearing, Thompson evaded the fraud order by executing an affidavit which provided not only that he would absolutely discontinue the enterprise but that it would not be continued or resumed by any one else either under the original name or a new designation. It was further agreed that should the business be found to be continuing, a fraud order should then be issued against any name or names under which it might be operating. On Sept. 4, 1941, Thompson addressed a letter to the Post Office in which he complained that it was an injustice to him that the business of which he had been deprived by the fraud order was now being operated by a Mrs. P. W. Bell who, he claimed, had purchased it through his bankruptcy. Mrs. Bell, apparently in partnership with her husband, continued to operate the fraud through the mails, assuming the trade styles Sur-Way Electric Company, Sur-Way Electric Hair Brush Company and Hollywood Electric Hair Brush Company. The Bells in turn were notified by the Post Office to show cause why they should not be debarred from the mails for conducting a fraud. They did not appear at the hearing of the case held on Dec. 1, 1941, but Mrs. Bell sent an answer to the charges, claiming that the former owner of the business had assured her at the time that she purchased it that "there was no fraud so long as we made refunds." She further declared that because of her inability to obtain materials she had been forced to close the business in the previous December and since then had been "keeping open" only to do repair work and make refunds. Nevertheless the Post Office found evidence that she had continued to solicit business through the mails. As the scientific testimony which expert medical witnesses for the government at the hearing held on Dec. 1, 1941 showed that though the electric hair-brush in question might stimulate the scalp circulation and even produce a fine, downy growth, it could not restore hair growing power to follicles which are completely atrophied, as is the case in most instances

of baldness. Accordingly, a fraud order was issued on March 3, 1942 against the names Sur-Way Electric Company, Sur-Way Electric Hair Brush Company, Hollywood Electric Hair Brush, Hollywood Electric Hair Brush Company and their officers and agents.

The Pandiculator Company.—This department of THE JOURNAL, April 4, 1942, page 1240, contained an article which reported in detail the fraud order which the Post Office Department had issued on Dec. 8, 1941 against the Pandiculator Company of Cleveland, a concern that for over thirty years had been perpetrating on the public a swindle in the form of an alleged spine stretching, height increasing mechanism called "The Pandiculator." The article showed that, according to the evidence brought out at the hearing of this case the business was wholly owned by a Cleveland attorney, one Henry C. Crowell, designated as "secretary," whose name was included in the fraud order, and the discussion concluded with the comment "Thus passes—it is hoped—a scheme that has swindled the credulous for many years." Hardly was the ink dry, however, when it was learned that already (April 3) the Post Office had found it necessary to issue an additional fraud order, this one against Crowell himself. Soon after the original one was issued the Post Office discovered that the swindle was being continued by Crowell under his personal name and that in one circular letter which he was putting out, and which was identical in form and content with one used before the first fraud order was issued, Crowell had added the postscript "Address me at 11422 Mayfield Rd." The circular letter was dated Feb. 26, 1942. The Post Office inspector whose investigation of the activities of the Pandiculator Company had resulted in the fraud order against it now instituted a test correspondence with H. C. Crowell. He wrote Crowell, in effect, that he had procured one of the circulars of the Pandiculator concern about a year previously but that recently, after sending in an order for the device, his letter had been returned, "marked fraud or nothing," and that he had been advised that a letter to H. C. Crowell probably would receive a reply. It did—on the letterhead of Henry C. Crowell, who wrote: "Glad to hear from you. Who gave you my address? Yes, if you will mail me personally, $25. I will see you get a Family Model. Better make it prompt." Since the evidence gathered by the Post Office clearly indicated that Crowell was seeking to evade the terms of the original fraud order against the Pandiculator Company by soliciting remittances for the device by means of the circular letter containing representations substantially similar to the earlier claims, a new fraud order was issued on April 3, 1942 against the names H. C. Crowell and Henry C. Crowell.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO, Feb. 15, 1943. Sec., Council on Medical Education and Hospitals, Dr. H. G. Weiskotten, 535 North Dearborn Street, Chicago.

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Dec. 5, page 1158.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 15-16. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARIZONA: * Phoenix, Jan. 5-6. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco, Dec. 16. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

COLORADO: * Denver, Jan. 5-8. Applications must be on file before Dec. 21. Sec., Dr. John B. Davis, 831 Republic Bldg., Denver.

DELAWARE: Dover, July 13-15. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

GEORGIA: March. Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

HAWAII: Honolulu, Jan. 11-14. Sec., Dr. James A. Morgan, 48 Young Bldg., Honolulu.

IDAHO: Boise, Jan. 12. Dir., Bureau of Occupational Licenses, Mr. Walter Curtis, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Jan. 19-21. Superintendent of Registration, Department of Registration and Education, Mr. Philip M. Harman, Springfield.

INDIANA: Indianapolis, Jan. 13-15. Sec., Board of Medical Registration and Examination, Dr. W. C. Moore, 301 State House, Indianapolis.

KENTUCKY: Louisville, March 2-4. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. Third St., Louisville.

MICHIGAN: * Ann Arbor and Detroit, June 11-13. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 100 W. Allegan St., Lansing.

MINNESOTA: * Minneapolis, Jan. 19-21. Sec., Dr. Julian F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul.

MISSISSIPPI: Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: Helena, April 6-7. Sec., Dr. Otto G. Klein, First National Bank Bldg., Helena.

NEW HAMPSHIRE: Concord, March 11-12. Sec., Board of Registration in Medicine, Dr. Deering G. Smith, State House, Concord.

NEW MEXICO: * Santa Fe, April 12-13. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Jan. 25-28. Chief, Bureau of Professional Examinations, Mr. H. L. Field, 315 Education Bldg., Albany.

NORTH CAROLINA: December. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 5-8. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OREGON: *Written.* Portland, January. Exec. Sec., Miss Lorienne M. Confire, 608 Failing Bldg., Portland.

PENNSYLVANIA: *Written.* Philadelphia, Jan. 5-7; *Bedside.* Philadelphia, Jan. 8-9. Act. Sec., Bureau of Professional Licensing, Mrs. Marguerite G. Steiner, Department of Public Instruction, 358 Education Bldg., Harrisburg.

RHODE ISLAND: * Providence, Jan. 7-8. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Pierre, Jan. 19-20. Dir., Medical Licensure, State Board of Health, Dr. J. F. D. Cook, Pierre.

TENNESSEE: Memphis, Dec. 16-19. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

TEXAS: Austin, Dec. 28-30. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas.

UTAH: Salt Lake City, June. Dir., Department of Registration, Mr. G. V. Billings, 324 State Capitol Bldg., Salt Lake City.

VERMONT: Burlington, March 25-27. Sec., Dr. F. J. Lawliss, Richford.

WASHINGTON: * Seattle, Jan. 11-13. Dir., Department of Licenses, Mr. Thomas A. Swayze, Olympia.

WEST VIRGINIA: Charleston, March 1-3. Commissioner, Public Health Council, Dr. C. F. McClintic, State Capitol, Charleston.

WISCONSIN: * Madison, Jan. 12-14. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

WYOMING: Cheyenne, Feb. 1-2. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, Dec. 15. Act. Sec., Dr. Robert L. Nugent, University of Arizona, Science Hall, Tucson.

COLORADO: Denver, Dec. 16-17. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: Feb. 13. Address State Board of Healing Arts, 1945 Yale Station, New Haven.

DISTRICT OF COLUMBIA: Washington, April 19-20. Sec., Commission on Licensure, Dr. George C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: DeLand, June 9. Sec., Dr. J. F. Conn, John B. Stetson, University, DeLand.

IOWA: Des Moines, Jan. 12. Dir., Division of Licensure & Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MICHIGAN: Ann Arbor and Detroit, Feb. 12-13. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

MINNESOTA: Minneapolis, Jan. 5-6. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.

NEW MEXICO: Albuquerque, Feb. 1. Sec., Miss Pia Jorger, State Capitol, Santa Fe.

OKLAHOMA: Oklahoma City, May, 1943. Sec., Dr. Oscar C. Newman, Shattuck.

OREGON: Portland, Feb. 13. Sec., Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

WASHINGTON: Seattle, Jan. 7-8. Dir., Department of Licenses, Mr. Thomas A. Swayze, Olympia.

Kansas September Report

The Kansas State Board of Medical Registration and Examination reports the written examination for medical licensure held at Kansas City, Sept. 15-16, 1942. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Seventeen candidates were examined, all of whom passed. Ten physicians were licensed to practice medicine by reciprocity. The following schools were represented:

School	PASSED Year Grad.	Number Passed
University of Kansas School of Medicine	(1942, 13)	13
Tulane University of Louisiana School of Medicine	(1940)	1
Creighton University School of Medicine	(1942)	1
University of Nebraska College of Medicine	(1941)	1
University of Wisconsin Medical School	(1941)	1

School	LICENSED BY RECIPROCITY Year Grad.	Reciprocity with
Northwestern University Medical School	(1912)	Illinois
Louisiana State University School of Medicine	(1936)	Louisiana
University of Minnesota Medical School	(1939)	Michigan
Medico-Chirurgical College of Kansas City	(1903)	Missouri
University Medical College of Kansas City	(1896)	Missouri
Washington University School of Medicine	(1918)	Missouri
University of Nebraska College of Medicine	(1941)	Nebraska
New York Homeopathic Medical College and Flower Hospital	(1925)	Dist.Colum.
University of Tennessee College of Medicine	(1940)	Tennessee
Vanderbilt University School of Medicine	(1928)	Alabama

Rhode Island September Report

The Rhode Island Board of Examiners in Medicine reports two physicians licensed to practice medicine on endorsement of credentials of the National Board of Medical Examiners on Sept. 10, 1942. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.
Harvard Medical School		(1941)
Tufts College Medical School		(1941)

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Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Negligent Diagnosis as to Location of Bullet.—The patient received a bullet wound on the right side of his back just above the hip and was taken to a hospital for treatment. It was then shortly after midnight on a Sunday morning. First aid was administered and at about 8 a. m. the patient was attended by one of the staff surgeons at the hospital. The patient died at 6:35 p. m. that same day. Subsequently the administrator of the patient's estate filed suit for malpractice against the chief roentgenologist of the hospital and the estate of the staff surgeon, who had died before suit was commenced. From a judgment for the plaintiff, defendants appealed to the Supreme Court of Michigan.

The staff surgeon at the time he examined the patient thought that he felt the bullet through the skin on the right side of the patient's abdomen. Later three roentgenograms were taken. The defendant roentgenologist, who neither saw the patient nor took the roentgenograms, testified that from his examination of the films it was his opinion at the time that the bullet was located in the soft structure just below the surface of the skin and to the left of the median line, in the anterior portion of the left side of the abdomen. When the roentgenograms were received in evidence, they showed that the letter R thereon had been scratched over the letter L. The roentgenologist testified that this change was made owing to the fact that the staff physician disagreed with his diagnosis and that the latter's clinical findings led him to believe that there might have been some confusion in the marking of the roentgenograms. The roentgenologist's first report, made the following day, reported the presence of the bullet in the soft structures to the right of the median line. A second report, however, dated about three months later, stated that a further study of the roentgenograms showed the presence of a bullet in the soft structures to the left of the median line. The coroner's physician who performed an autopsy testified that the bullet was found in the abdominal cavity in the left quadrant and that the cause of death was an internal hemorrhage. It was his opinion that an operation to check and ultimately stop hemorrhages by suturing the perforations in the intestine "would have a tendency to preserve life," but that, under the usual and ordinary practice of a surgeon of average skill, a patient who is in a state of shock should not be operated on until that condition has subsided. The plaintiff produced an expert witness who testified that the usual and standard practice of ordinary surgeons and physicians in that community was to have immediate surgical intervention, that an operation is the only thing that stops the hemorrhage and that by stopping the hemorrhage one has a chance to save a person's life. The probability was, he added, that the life of the patient could have been saved by an immediate operation, when the patient was in fairly good condition.

The defendants first contended that the trial court erred in admitting the testimony of the plaintiff's expert because he was only a medical student at the time the patient was shot. The court held that the testimony of such witness was admissible because his study had resulted in the formation of a definite opinion and that he was entitled to express that opinion, the weight to be given to his testimony being a matter for the jury. The defendants also contended that it was error to admit the patient's hospital records in evidence since such records were privileged and that the privilege could be waived only by the patient. With this contention the court disagreed, holding that the administrator or executor of the estate of a patient may waive the privilege.

From the autopsy and subsequent study of the roentgenograms, said the court, it was clear that the staff surgeon misapprehended the course which the bullet had taken. If the bullet had in fact lodged on the right side, the wound would have been superficial. Whether or not the surgeon would have operated had he known the true location of the bullet and whether or not an operation would have saved the patient's life were disputed questions of fact. The jury could have inferred that the staff surgeon relied on his manual examination, in which he incorrectly thought that he felt the bullet on the right side, and that he paid little heed to the roentgenograms. Refusal to give them due consideration could be regarded as negligent diagnosis of the serious injury. The roentgenologist, the court continued, testified that a merely casual examination of the roentgenograms had been made and that he found the bullet over the left side when he looked at them carefully. There was expert testimony that the bullet showed plainly on the roentgenograms and that an expert roentgenologist could tell which side of the body was the right or left without resort to any markings on the films. That the defendant roentgenologist did not make a careful study of the roentgenograms was admitted by his own testimony. The jury could infer that if the defendant roentgenologist had studied them more carefully he would not so readily have concluded that there had been some confusion in their marking and would not have had the R scratched over the L. His unconsidered acquiescence with the staff surgeon as to the location of the bullet could be found to have prevented further diagnosis by both of the physicians. Thus the negligence of both resulted in an inaccurate diagnosis of the course taken by the bullet.

Since the medical experts agreed that the deceased was almost certain to die unless an operation were performed, the jury could properly infer that the staff surgeon would have operated if he had known the true position of the bullet. The negligent diagnosis then was the proximate cause of the failure to operate. There was testimony that an operation would probably have saved the patient's life. Therefore the negligent diagnosis could be said to have been the proximate cause of the death. Other contentions of the defendants were also overruled and the judgment for the plaintiff was affirmed.—*Harvey v. Silber, 2 N. W. (2d) 483 (Mich., 1942).*

Workmen's Compensation Acts: Disability Resulting from Mental Shock.—The claimant, a woman, was employed as an elevator operator. A passenger was caught between the floor of her elevator and the second floor of the building and killed, and the claimant was lodged in the elevator with the dying man for some thirty minutes before the doors were broken in and his body removed. In a subsequent proceeding under the workmen's compensation act, the evidence showed that the claimant suffered so great a shock to her nervous system that her recollection was hazy as to what happened, that she was in a state of extreme excitement when she was removed from the elevator and had lost control of her emotions, that her heart beat was rapid and her blood pressure increased, that it was necessary for her to remain in a hospital for several days thereafter, that she was still under medical care at the time of the hearing and that further hospitalization was to be desired. The claimant suffered no physical injury to her person as the result of the accident but did suffer pains in the head and back and she was unable to perform the work of an elevator operator or similar work. She was awarded compensation, and the employer appealed to the Supreme Court of Nebraska.

The workmen's compensation act defines an accident as "an unexpected or unforeseen event happening suddenly and violently . . . and producing at the time objective symptoms of an injury. The term 'injury' and 'personal injuries' shall mean only violence to the physical structure of the body. . . ." That there was an unexpected or unforeseen event happening suddenly and violently was clear to the court. The evidence showed that the plaintiff was irrational and hysterical after the accident, that her blood pressure was considerably higher and that her pulse was more rapid. Medical experts testified that, when she was examined, the pupils of her eyes were dilated, her posture was abnormal and she had tremors and an inability to walk in her usual manner. These were objective symptoms of injury. Was there violence to the physical structure of the body? Can it be said that disabling shock and nervousness, when unaccompanied by an impairment of the physical structure of the body, is compensable?

The act requires not only that there be an accident attended by objective symptoms arising out of and in the course of the

employment but that the accident must be accompanied by violence to the physical structure of the body. The language indicated to the court a clear distinction between physical and bodily injury on the one hand and mental, nervous and psychiatric injury unaccompanied by violence to the physical structure of the body on the other. The plain import of the words used, as construed by the court, eliminated from the operation of the act disabilities resulting from mental disturbances, nervousness and psychiatric ailments when violence to the physical structure of the body cannot be established. And since the claimant suffered no damage to the physical structure of her body she was not entitled to an award of compensation. Accordingly the award in favor of the claimant was reversed and the proceeding dismissed.

A dissenting justice questioned the conclusion reached by the court. In his opinion, the lawmakers, by the use of the term "violence to the physical structure of the body," meant an animate body with a directing brain containing blood, sensitive nerves, fibers and convolutions. The brain, this justice pointed out, is a part of the physical structure of the body and without it there could be no performance of an employee's duties. Accidental violence to the brain and resulting disability may be difficult to prove but in this instance the claimant was rational before the accident and irrational afterward. Her blood pressure was higher and her pulse more rapid. The pupils of her eyes were dilated and her posture abnormal. She had tremors and was unable to walk in her usual manner. These results of the accident, in the view of this justice, presented evidence of "violence to the physical structure of the body" within the meaning of the workmen's compensation act.—*Bekelcski v. O. F. Neal Co., 4 N. W. (2d) 741 (Neb., 1942).*

Hospitals: Liability for Negligence of Hospital Nurse Assisting Physician During Operation.—The patient underwent an appendectomy in the defendant hospital, being operated on by her own physician. Four hospital nurses assisted in the operation during the course of which the physician called for some warm water with which he intended to irrigate the wound. The water was brought by one of the nurses and was poured in the wound, and because it was too hot the patient was burned. The patient sued the physician and the hospital for damages and obtained a settlement from the physician's insurance company. The hospital refused to participate in the settlement, the physician assigned all his rights to the insurance company and in this case the company sought to compel the hospital to contribute its share of the settlement amount on the theory that the nurse or nurses were also negligent and that the hospital was jointly liable with the physician as their employer. From a judgment for the defendant notwithstanding a verdict for the plaintiff, the plaintiff appealed to the Supreme Court of Minnesota.

The sole question determined by the court was whether a hospital can be held liable for the acts of its nurses while they are assisting a physician during an operation. In Minnesota a hospital, private or charitable, is liable to a patient for the torts of its employees under the doctrine of respondeat superior. It follows logically that a physician is also liable, on the same theory, for the negligence of a nurse in his employ. The crux of the case, then, was whether the nurses at the time of the alleged negligence were the employees of the physician or of the hospital. Concededly, they were in the general employ and pay of the hospital and assigned by it to assist in the operation. However, the acts complained of occurred during the operation, were ordered and checked by the operating surgeon and were of such a nature that, according to the surgeon's own testimony, the nurses while performing them were under his absolute control. The court after citing with approval the general rule that "Where a servant has two masters, a general and a special one, the latter, if having the power of direction or control, is the one responsible for the servant's negligence," pointed out that the desirability of the rule was obvious. The patient is completely at the mercy of the surgeon and relies on him to see that all the acts relative to the operation are performed in a careful manner. It is the surgeon's duty to guard against any and all avoidable acts that may result in injury to his patient.

The insurance company contended, however, that even though the physician was responsible for the nurses' acts, the hospital was also liable as "joint master." But, said the court, when the general employer assigns his servant to duty for another and surrenders to the other direction and control in relation to the work to be done, the servant becomes the servant of such other person as far as his services relate to the work so controlled and directed. His general employer is no longer liable for the servant's torts committed in the directed and controlled work. In the operating room the surgeon must be master. He cannot tolerate any other voice in the control of his assistants. In the case at bar, the evidence was clear that the physician had exclusive control over the acts in question, and the court therefore held that the hospital could not be said to have been a "joint master" or "co-master," even though the nurses were in its general employ and paid by it. Accordingly the judgment in favor of the defendant hospital was affirmed.—*St. Paul-Mercury Indemnity Co. v. St. Joseph's Hospital, 4 N. W. (2d) 637 (Minn., 1942).*

Workmen's Compensation Acts: Right of Employer to Require Employee to Submit to Roentgen Examination with Use of Injection of Iodized Poppy Seed Oil.—In an action for an award under the Louisiana workmen's compensation act, the defendant employer argued, among other things, that a judgment for the plaintiff employee was erroneous because the trial court had refused to require the plaintiff to submit to a roentgen examination with the use of an injection of iodized poppy seed oil and also had refused to permit the defendant's witness to test in court the achilles reflexes of the plaintiff. The defendant's appeal was to the United States circuit court of appeals, fifth circuit.

The court held that the matter of the achilles reflex test, if theoretical, was a harmless, indeed almost frivolous, error. As to the iodized oil test, the court said that, while an employee must accept simple and harmless treatment, the judge, when there is a conflict of opinion among medical experts as to its effect or its danger, has a discretion to order or to refuse to order it. There was positive evidence that the injection of iodized oil might cause serious damage and, furthermore, that, after it was undergone, the conclusions drawn from it were largely negative. Without undertaking to determine whether under other circumstances and other proof an examination with the aid of the iodized oil injection might be properly requested, the court concluded that under the circumstances of this case the trial judge was well within his discretion in refusing to order the plaintiff to submit to the examination. The judgment in favor of the plaintiff was affirmed.—*Sullivan, Long & Haggerty, Inc. v. Washington, 128 F. (2nd) 466 (1942).*

Society Proceedings

COMING MEETINGS

Annual Congress on Industrial Health, Chicago, Jan. 11-13. Dr. Carl M. Peterson, 535 North Dearborn St., Chicago, Secretary.

American Academy of Orthopaedic Surgeons, Chicago, Jan. 17-21. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Acting Secretary.

American Society of Anesthetists, New York, Dec. 10. Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.

Annual Forum on Allergy, Cleveland, Jan. 9-10. Dr. Jonathan Forman, 956 Bryden Road, Columbus, Ohio.

Clinical Orthopaedic Society, Chicago, Jan. 18-21. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.

Eastern Section, American Laryngological, Rhinological and Otological Society, Hartford, Conn., Jan. 15. Dr. Edward J. Whalen, 750 Main St., Hartford, Conn., Chairman.

Middle Section, American Laryngological, Rhinological and Otological Society, Detroit, Jan. 20. Dr. Voss Harrell, 2539 Woodward Ave., Detroit, Chairman.

Society of American Bacteriologists, Columbus, Ohio, Dec. 28-30. Dr. W. B. Sarles, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.

Southern Section, American Laryngological, Rhinological and Otological Society, Chattanooga, Tenn., Jan. 28. Dr. Francis B. Blackmar, 1301 Broadway, Columbus, Ohio, Chairman.

Western Section, American Laryngological, Rhinological and Otological Society, Portland, Ore., Jan. 31. Dr. Irving M. Lupton, 1020 S.W. Taylor St., Portland, Ore., Chairman.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

26:529-660 (Sept.) 1942

*Cerebral Reactions Associated with Massive Mapharsen Treatment of Early Syphilis. E. W. Thomas, Gertrude Wexler and B. Dattner, New York.—p. 529.

Importance of Time Factor in Evaluation of "Cure" in Syphilitic Rabbits. H. Eagle, R. B. Hogan and J. E. Kemp, Baltimore.—p. 537.

Some Morphologic Features of Nichols Strain of Treponema Pallidum as Revealed by Electron Microscope. H. E. Morton, Philadelphia, and T. F. Anderson, Camden, N. J.—p. 565.

*Intravenous Thiamine Chloride (Vitamin B_1) in Treatment of Tabetic Lightning Pains. K. D. Cochems, Chicago, and J. E. Kemp.—p. 574.

Some Epidemiologic Aspects of Gonorrhea in the United States Navy. C. S. Stephenson and F. R. Lang, Washington, D. C.—p. 584.

Experiments on Transportation of Gonococcic Pus for Culture Purposes. A. Cohn, New York.—p. 598.

Culture Examination for Neisseria Gonorrheae: I. Comparison of Direct and Shipped Specimens for Culture. Lucy S. Heathman and Margaret Higginbotham, Minneapolis.—p. 602.

Id.: Comparison of Chocolate Agar with Cystine Chocolate Agar Medium. Margaret Higginbotham, Minneapolis.—p. 607.

Morphologic and Cultural Behavior of Gonococcus in the "Carrier." W. A. Casper, New York.—p. 614.

Use of Quantitative Test in Verification Procedures. Bettina B. Carter, Louisville, Ky.—p. 629.

*Sensitivity and Specificity of Kahn Reaction in Temperature Range from 37 C. Through 56 C. with Syphilitic Serums, with Consideration of Value of Kahn Verification Test in Syphilis. M. N. Green and G. F. Forster, Chicago, with collaboration of clinical staff of Public Health Institute.—p. 632.

Preliminary Intensive Treatment of Primary Syphilis by Daily Injection of Arsenicals: Preliminary Report of 105 Cases. I. A. Pelzman and E. Greenwald, Fort Belvoir, Va.—p. 637.

Cerebral Reactions and Mapharsen Treatment of Syphilis.—Thomas and his associates treated 764 cases of early syphilis with massive mapharsen therapy. The drug was given in divided doses by syringe, mapharsen alone to 280 patients and mapharsen combined with fever induced by typhoid vaccines to 484. The chief hazard of such treatment is reactions involving the cerebrospinal axis, the only significant laboratory observation of which is increased protein in the spinal fluid. Among the 764 patients treated 16, 2.09 per cent, showed changes indicative of irritation of the central nervous system. Only 8 of the 16 showed clinical signs; severe headaches, unusual complaints or rises in temperature, other than the Herxheimer reaction frequently encountered on the first day of treatment, are indications for examining the spinal fluid. There were no qualitative or consistent quantitative differences in the spinal fluid of those with and of those without clinical signs of encephalitis. Possibly the pathologic process in the symptomless group was confined to silent areas of the cerebrospinal axis, but it is more probable that the spinal fluid changes are not an accurate index of the amount of damage caused by a lowered resistance to arsenic. The combination of fever and mapharsen was originally adopted in the hope of avoiding cerebral reactions, but this hope was not fulfilled as their incidence remained much the same. However, the clinical signs of reactions in the group having fever were milder than those given mapharsen alone. This is probably best explained by the lower dose of mapharsen necessary with fever. No deleterious sequelae have been observed in the 14 who survived. The reactions appeared to vary as to time of onset in relation to treatment and duration of symptoms. In the main they are vascular in type and the functional damage to cells is out of proportion to the structural changes found. The changes in 1 of the fatal cases were attributed to acute syphilitic meningoencephalitis. Erythema of the ninth day was associated in 4 of the patients; this suggests that there may be a common mechanism underlying these two reactions, but one may occur without the other. Dosage played a more significant role in arsenical encephalitis than is true of the erythema.

Thiamine Hydrochloride in Tabetic Lightning Pains.—Cochems and Kemp tried the intravenous use of thiamine hydrochloride for the relief of the lightning pains of 26 patients with tabetic neurosyphilis. The largest amount received by any patient was 3,190 mg. in sixty-three doses and the smallest was 20 mg. in two doses; the average was 1,098 mg. in eighteen doses. No final relief was obtained by 17; partial, possibly permanent, relief was obtained by 4 and complete, possibly permanent, relief by 5. The 9 who reported relief have been observed for an average of only seven weeks after subsidence or disappearance of their pain. Six of the 9 have lapsed from observation and the 3 remaining patients have continued regular clinic attendance, but they have been observed for only two weeks, three weeks and six months, respectively, and their relief has apparently been maintained.

Sensitivity and Specificity of Kahn Reaction.—Green and Forster used the Kahn verification technic on the serums of 119 syphilitic and 127 nonsyphilitic persons. The tests were made at both 37 and 45 C. Of the 119 syphilitic serums 85 of which gave positive reactions in the verification test, 44 gave greater reactions at 45 C., 23 reacted equally at the two temperatures, 18 gave slightly stronger reactions at 37 C. and 34 gave no reaction. The corresponding figures for the 127 nonsyphilitic serums were 1 (doubtful), 0, 0 and 126. In general, however, reactions at 45 C. were more sensitive than at 37 C. by two to four reading units. There were 16 syphilitic serums negative with the standard Kahn test which gave verification reactions of a syphilitic type at 37 and 45 C. To determine the limit of maximal sensitivity of the syphilitic reaction 63 syphilitic serums were tested simultaneously at 37, 45, 50 and 56 C. and at 1 C. as a control. More serums showed a maximal reaction at 45 C. than at the other temperatures; it dropped off slightly but progressively at 50 and 56 C. Apparently the usefulness of the verification reaction lies no less in the diagnosis of syphilis than in the recognition of falsely positive reactions.

Anesthesiology, New York

3:491-610 (Sept.) 1942

Neurogenic Control of Circulation of Dogs Under Ether Anesthesia. F. F. McAllister and W. S. Root, New York.—p. 491.

Problems of Anesthesia in Plastic Surgery. R. A. Gordon.—p. 507.

Monocaine Formate: Its Application in Spinal Anesthesia. D. L. Burdick and E. A. Rovenstine, New York.—p. 514.

*Continuous Spinal Anesthesia. Virginia Apgar, New York.—p. 522.

Cardiac Arrhythmias Which Occur Spontaneously in Cats During Cyclopropane Anesthesia. C. R. Allen, J. W. Stutzman, R. Foregger and W. J. Meek, Madison, Wis.—p. 539.

Local and Regional Anesthesia. T. H. Seldon and J. S. Lundy, Rochester, Minn.—p. 540.

Gases Encountered in Warfare. A. W. Friend and R. M. Tovell, Hartford, Conn.—p. 546.

Anesthesia Service for Small Hospitals. H. R. Griffith, Montreal, Canada.—p. 553.

Inorganic Gases in Anesthesiology. J. Adriani, New Orleans, and D. H. Batten, Brooklyn.—p. 560.

Continuous Spinal Anesthesia.—Apgar discusses difficulties encountered while administering continuous spinal anesthesia to 422 patients. The chief difficulties have been in maintaining an adequate blood pressure and in controlling pain and retching associated with traction in the upper part of the abdomen. In 60 per cent the state of the circulation was unsatisfactory (a low systolic pressure, a small pulse pressure and usually a slow pulse rate) at some time during the operation. The usual precipitating causes for the drop in pressure were too much procaine at one time, traction on abdominal viscera and change of position during anesthesia. Ephedrine in divided doses raised the pressure in all but 25 in whom it was tried. In these 0.2 cc. of a 1:1,000 solution of epinephrine fifteen to twenty minutes after ephedrine usually produced a moderate and sustained increase. The next unsolved problem was epigastric or substernal pain, with retching, vomiting or hiccups during operations on the upper part of the abdomen. Morphine and scopolamine proved satisfactory for controlling these reactions. A few patients became uncooperative, restless and talkative from the preoperative medication but were con-

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trolled by small amounts of 2.5 per cent pentothal sodium. Some technical difficulties arose; in 5 elderly arthritic patients the needle could not be introduced, in 3 no anesthesia was obtained, in 1 the needle became displaced while the patient was being moved from the supine to the lithotomy position and in 1 after two hours of satisfactory anesthesia the needle became plugged with a small foreign body. This high incidence of difficulties was due in part to the frequent change of residents. The best feature of the method is the absence of severe respiratory depression during operation. For operations on the upper part of the abdomen endotracheal anesthesia with either cyclopropane or ether is more controllable and protects the patient better from reflex disturbance, but the method has a definite place in operations on the lower part of the abdomen, in prolonged operations on the extremities or in the open reduction of comminuted fractures. For any operation likely to involve unusual blood loss, inhalational methods are better.

Annals of Otol., Rhin. and Laryngology, St. Louis

51:577-880 (Sept.) 1942. Partial Index

*Intrasinal Application of Sulfonamide Powder. L. A. Brown, Atlanta, Ga.—p. 611.

Bilateral Jugular Ligation Following Bilateral Suppurative Mastoiditis. M. G. Evans, Boston.—p. 615.

Significance of Nose in Allergic States. R. J. Frackelton, Lakewood, Ohio.—p. 626.

Changing Conception of Management of Chronic Progressive Deafness. F. T. Hill, Waterville, Maine.—p. 653.

Air Pressures in Nose and Maxillary Sinus Under Normal Conditions in Disease. D. K. Judd, Chicago.—p. 689.

Treatment of Congenital Atresia of Choanae. V. H. Kazanjian, Boston. —p. 704.

Roentgen Findings in Acute Infections of Mastoid Cells. A. S. Macmillan, Boston.—p. 718.

Hearing in Chronic Otitis Media. P. E. Meltzer, Boston.—p. 727.

Massive Hemorrhage as Otolaryngologic Complication. F. E. Motley, Charlotte, N. C.—p. 737.

Surgical Treatment of Otosclerosis: Comparative Analysis of Results Using Different Technics. G. E. Shambaugh Jr., Chicago.—p. 817.

Adenoma (Mixed Tumor) of Bronchus: Study of Thirty-Five Cases. L. H. Clerf and C. J. Bucher, Philadelphia.—p. 836.

Kodachrome Visualization of Physiology and Pathology of Tracheobronchial Tree. P. H. Holinger, Chicago.—p. 851.

Intrasinal Application of Sulfonamide Powder.—Brown applied a sulfonamide powder intrasinally to 5 patients with chronic purulent sinusitis who would have been advised to have a radical operation on the affected sinuses had it not been for the improvement that followed this treatment. All 5 patients have been dismissed as well. Under local anesthesia a submucous resection was done unless the nasal septum was deviated sharply away from the infected side. Half of the anterior middle turbinate was removed. The natural ostium of the antrum was enlarged with a sphenoid punch forceps to at least three times its normal size. The nasofrontal duct was located, and the anterior ethmoid cells around this were removed. A rasp was introduced into the nasofrontal duct and the duct was enlarged so that a number 3 eustachian catheter could be passed into the frontal sinus with ease. If the posterior cells or the sphenoid sinus were infected, more ethmoid cells were removed. The frontal and maxillary sinuses were washed with saline solution and then followed by injection of air. The eustachian catheter was passed into the frontal sinus through the enlarged opening, a column of air from the wall pressure or small motor compressor under extremely low pressure was blown through the loosely fitting catheter, and when it was ascertained that there was no obstruction a common powder blower, half filled with a sulfonamide powder, was inserted into the dilated end of the eustachian catheter, the air pressure was attached to the powder blower and sufficient powder was blown into the sinus to cause some to come into the nose from the sinus. This procedure was repeated in the maxillary sinus through the enlarged natural ostium. A small amount of powder was sprayed directly from the powder blower into the anterior ethmoid region. Light nasal packing of plain gauze was used only when a submucous resection was done to hold the septal flaps together, and it was removed in about eighteen hours. If the patient complains of severe pain when the rasp is introduced, a general anesthetic is given. Patients usually went home on the third day, when the sinuses were again insufflated. After this, for four to eight weeks, insufflation was carried out twice a week at the office. For the procedure in the office the nose was prepared by spraying it with a 1 per cent aqueous solution of cocaine hydrochloride after the sinuses were washed with saline solution.

Archives of Pathology, Chicago

34:613-790 (Oct.) 1942

Comparative Pathology of Induced Tumors of Salivary Glands. P. E. Steiner, Chicago.—p. 613.

Mechanism of Parathyroid Hormone Action. H. Selye, Montreal, Canada.—p. 625.

Renal Changes in Albino Rat on Low Choline and Choline Deficient Diets. K. Christensen, St. Louis.—p. 633.

Variation of Vitamin A Fluorescence in Cyclic Changes of Ovary. A. B. Ragins and H. Popper, Chicago.—p. 647.

Comparison of Pathologic Observations in Weil's Disease and Yellow Fever. W. H. Harris Jr., New Orleans.—p. 663.

Tumors of Striatothalamic and Related Regions: Their Probable Source of Origin and More Common Forms. J. H. Globus, New York, and H. Kuhlenbeck, Philadelphia.—p. 674.

Anatomic Changes in Prostate of Patients with Cirrhosis of Liver. S. D. Wu, St. Louis.—p. 735.

Effects of Radiation on Normal Tissues: IV. Effects of Radiation on Gastrointestinal Tract, Including Salivary Glands, Liver and Pancreas. S. Warren and N. B. Friedman, Boston.—p. 749.

Archives of Surgery, Chicago

45:507-690 (Oct.) 1942

*Intraperitoneal Injection of Vaccine in Prevention of Postoperative Peritonitis. C. Dixon, J. A. Bargen and W. J. Tennison, Rochester, Minn.—p. 507.

*Results Following Ligation of Internal Carotid Artery. W. E. Dandy, Baltimore.—p. 521.

Influence of Hypophysectomy on Epithelization of Wounds and on Fibroplasia. C. B. Mueller and E. A. Graham, St. Louis—p. 534.

Adenoma of Bronchus with Successful Pneumonectomy: Report of Case. D. G. Mason, San Francisco, and T. Coberth, The Dalles, Ore. —p. 542.

*Administration of Dicoumarin Compound for Prophylaxis of Postoperative Thrombosis and Embolism: Preliminary Report. W. L. Butsch and J. D. Stewart, Buffalo.—p. 551.

*Association of Pernicious Anemia and Carcinoma of Stomach. P. C. Doehring and G. B. Eusterman, Rochester, Minn.—p. 554.

Peritoneal Fluid and Gastric Contents in Cases of Perforated Peptic Ulcer. C. M. Henry, Detroit.—p. 564.

Behavior of Rabbits After Infection with Toxigenic and Nontoxigenic Staphylococci: Experimental Study. B. Kleiger, J. E. Blair and Frances A. Hallman, New York.—p. 571.

Pseudohermaphroditism: Report of Two Cases. D. D. Kozoll, Evanston, Ill.—p. 578.

Blood Pressure Changes During Spinal Anesthesia in Nonoperative Cases. H. Koster, Brooklyn.—p. 596.

Afferent Conduction from Extremities Through Dorsal Root Fibers via Sympathetic Trunks: Relation to Pain in Paralyzed Extremities. A. Kuntz and G. Saccomanno, St. Louis.—p. 606.

Carcinoid Tumor of Appendix: Report of Case in Which Extensive Intra-Abdominal Metastases Occurred, Including Involvement of Right Ovary. R. A. Hopping, M. B. Dockerty and J. C. Masson, Rochester, Minn.—p. 613.

Exophthalmic Goiter of Juvenile Type: Survey of Literature on Familial Aspects of This Disease and Report of Two Additional Cases. R. R. Moolten and M. Bruger, New York.—p. 623.

Physiologic Changes Associated with Varicose Veins and Their Correction. W. Barrow, Lexington, Ky.—p. 633.

Mesenteric Vascular Occlusion: Review of Literature and General Principles; Report of Case with Operation and Recovery. H. J. Giamarino and S. A. Jaffe, New Haven, Conn.—p. 647.

Progress in Orthopedic Surgery for 1941: Review Prepared by an Editorial Board of the American Academy of Orthopaedic Surgeons. —p. 653.

Prevention of Postoperative Peritonitis.—Dixon and his associates compare data on 639 colon operations performed on 480 patients. Preceding 258 of them the vaccine was administered peritoneally and in 381 it was not administered. There were 18 hospital deaths among the first and 39 among the second group of operations; the respective figures for peritonitis were 10 and 25. A further comparison, made according to type of operation and the operating surgeon, showed about the same consistent advantage for the group that had received the vaccine as for the overall average results. Study revealed that the postvaccinal rise of temperature was an indication of immunity to postoperative peritonitis. Among patients whose postvaccinal temperature did not rise above 99.6 F. there was a definite reduction in the postoperative mortality rate as compared with patients whose postvaccinal temperature exceeded 99.6 F., indicating that the patient in whom the postvaccinal temperature did not rise above 99.6 F. was relatively immune to postoperative peritonitis. Study of patients who received two vaccinations showed that

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the postoperative mortality rate was lower in the group in whom the rise of temperature after the second vaccination was lower than after the first than in the group in whom the postvaccinal rise of temperature after the second vaccination was higher than that after the first. The results suggest that the efficiency of intraperitoneal injection of vaccine conferring immunity against postoperative peritonitis could be increased if prior to operation more than one vaccination was utilized and if one was guided by the postvaccinal rise of temperature following the first vaccination. A suggested plan includes multiple intraperitoneal injections six to eight days preoperatively. The intraperitoneal vaccine consisted of a sterile suspension of Escherichia coli and green producing streptococci. Intraperitoneal injections of solution of sodium chloride as practiced by Morton were also effective against postoperative peritonitis.

Results Following Ligation of Internal Carotid Artery.—Dandy states that with care in the interpretation of the preoperative tests of the adequacy of collateral circulation in the brain and with proper choice of the method of ligation of the internal or common carotid artery the two causes of death and disability, cerebral anemia and cerebral thrombosis and embolism, can now be largely eliminated. In his series of 88 cases all but 3 were ligations of the internal carotid. In the 3 exceptions, in addition to the common carotid, the external carotid was tied, so that the equivalent of ligation of the internal carotid resulted. All but 3 were total ligations for verified arterial or arteriovenous aneurysm of the brain or cerebral tumor. There were 4 immediate cerebral complications, 1 late cerebral complication and 4 deaths. The death of 1 patient was in no way connected with the operation, as the patient was dying at the time of the ligation. Another death was due to rupture of an intracranial aneurysm which was known to have broken when the operation was performed. If these 2 cases are eliminated, the mortality rate is 2.25 per cent. With greater care in applying an intracranial silver clip another death might have been prevented, and if a band of fascia had been interposed between the internal carotid and the silk ligature the late appearing hemiplegia and subsequent death of the fourth patient might also have been avoided. From the complications it appears that partial ligations are the most hazardous. The Matas test (compression of the internal carotid for ten minutes to determine whether or not cerebral functions are disturbed) was responsible for the low mortality and few cerebral complications. Many patients, regardless of age, will not tolerate total ligation. Partial closure will quickly establish cerebral collateral circulation, and complete closure can be safely concluded in about a week. By this means the reduced flow of blood through the internal carotid is adequate for the cerebral blood supply, but at the same time the demand is made for the anterior and posterior communicating arteries to supply the created deficit. There was no disturbance when total ligation followed preliminary partial closure. Without the Matas test most if not all of these patients would have died or been badly crippled from the effects of inadequate cerebral circulation if total occlusion had been done first. The danger in partial occlusion is in obliterating the lumen too far. If cerebral signs develop during the succeeding six or eight hours the band can be removed, and at times the cerebral circulation will be restored. For total ligation an interposed fascial band is probably the best assurance against thrombosis and the resulting late cerebral complications.

Prophylaxis of Postoperative Thrombosis and Embolism.—Butsch and Stewart determined the value of the practical use of the anticoagulant dicoumarin, which requires twenty-four to forty-eight hours to produce its effect, in 23 males undergoing inguinal herniorrhaphy to prolong the clotting time of the blood in the prophylaxis and treatment of thromboembolic disease. As the operative procedure was limited to the abdominal wall, any postoperative hemorrhagic phenomena could be readily discovered and corrected. Eighteen were operated on forty-eight hours after dicoumarin was begun orally and 5 still later. A dose of 0.32 Gm. of the agent was given by mouth in the morning two days and one day before operation. In every instance the incised tissue appeared normal, as was the healing process, the amount of blood oozing and hemostasis. Twenty-one wounds healed primarily; in 2 hematomas developed which required one aspiration for subsequent complete healing. The study demonstrates that herniorrhaphy can be performed with reasonable safety on patients with impairment in clotting produced by dicoumarin. Apparently enough thromboplastic substance is liberated in the incised wound to promote reasonably satisfactory hemostasis after the wound is sutured. The compound should not be given to patients with ulcerating or granulating areas because of the danger of hemorrhage from these areas.

Pernicious Anemia and Carcinoma of Stomach.—From 1917 to 1939 inclusive, according to Doehring and Eusterman, 40 patients with both pernicious anemia and carcinoma of the stomach were examined at the Mayo Clinic. In 26 the diagnosis of pernicious anemia preceded that of gastric carcinoma, in 2 the diagnosis of carcinoma preceded that of pernicious anemia and in 12 it was simultaneous. During the five years 1936 to 1939 approximately 1,014 patients with pernicious anemia were treated at the clinic and 17 of these had carcinoma of the stomach also. This incidence of 1.7 per cent seems slightly greater than the calculated incidence for the adult general population. The average age at which symptoms referable to pernicious anemia occurred was 54.5 years, while that for the symptoms of carcinoma was 63.2 years. Although present evidence is insufficient to prove a direct relation between the two diseases, there are grounds for suspecting that persons with pernicious anemia are more likely to have gastric carcinoma than normal persons.

Arkansas Medical Society Journal, Fort Smith

39:107-128 (Oct.) 1942

Finding Tuberculosis. H. L. Fuller, Little Rock.—p. 107.
Care of Simple Head Injury. R. M. Stuck, Denver.—p. 112.

Bulletin Johns Hopkins Hospital, Baltimore

71:123-190 (Sept.) 1942

*Role of Hypersensitivity in Periarteritis Nodosa as Indicated by Seven Cases Developing During Serum Sickness and Sulfonamide Therapy. A. R. Rich, Baltimore.—p. 123.
Study of Thiamine Deficiency in Swine: Together with Comparison of Methods of Assay. M. M. Wintrobe, H. J. Stein, M. H. Miller, R. H. Follis Jr., V. Najjar and S. Humphreys, Baltimore.—p. 141.
Observations on Nature of Tetany: Effect of Adrenalin. A. M. Harvey and J. L. Lilienthal Jr., Baltimore.—p. 163.
Relationship Between Serum Cholesterol and Total Body Cholesterol in Experimental Hyperthyroidism and Hypothyroidism. W. Fleischmann and H. B. Shumacker Jr., Baltimore.—p. 175.

Hypersensitivity in Periarteritis Nodosa.—Rich states that at Johns Hopkins Hospital a case of serum sickness rarely came to necropsy before the advent of sulfonamide therapy. Since its introduction necropsies on patients with serum sickness or on those who had had serum sickness shortly before death have been more frequent, as even in ultimately fatal cases the sulfonamides, used in conjunction with antiserum, may prolong life sufficiently to permit serum sickness to develop before death. Within nine months there were 4 cases with manifestations of serum sickness developing during the terminal illness. Because of the infrequency of necropsies on patients with serum sickness the first case was examined with particular interest and fresh lesions of periarteritis nodosa were encountered. The subsequent cases were studied carefully and again widespread, fresh lesions of periarteritis nodosa were found. In a fifth patient, who had received antiserum for pneumonia, serum sickness developed. A biopsy of a small piece of biceps muscle revealed definite periarterial inflammatory infiltration with polymorphonuclear and mononuclear cells. This patient was discharged in three months with hypertension and a slight persistent diminution in renal function. All 5 patients had been treated with foreign serum as well as sulfonamides, and 1 additional case indicated that sulfathiazole may, under certain conditions, produce lesions of periarteritis nodosa. This patient had carcinoma of the pancreas. Operation was limited to exploratory laparotomy and the patient was given repeated doses of sulfathiazole orally and intravenously as a prophylactic measure against aspiration pneumonia. Death occurred in a week. At necropsy hyaline necrosis and perivascular infiltration with mononuclear and polymorphonuclear cells characteristic of periarteritis nodosa were revealed. There were

widespread focal parenchymal lesions in the viscera (necrosis and infiltration with inflammatory cells). Only 1 of the 5 patients treated with serum had received sulfathiazole before the rash of serum sickness appeared, and the sixth received no sulfonamide drug. That serum sickness in the absence of sulfonamide therapy may be accompanied by lesions of periarteritis nodosa is suggested by the necropsy of only 1 patient who had had serum sickness shortly before death and who was treated before the sulfonamide era. Therefore 4 of the 5 patients had received sulfonamides, but in at least 2 of them evidence indicates that the hypersensitive reaction was serum sickness and not drug hypersensitivity. None of the patients had symptoms suggesting periarteritis nodosa prior to their terminal acute illness for which the serum and/or sulfonamide was administered. This study and other pertinent evidence indicate that these vascular lesions can be a manifestation of anaphylactic hypersensitivity and suggest that the inciting antigen be searched for.

Bulletin New York Academy of Medicine, New York

18:625-702 (Oct.) 1942

Adjustments of Nerve Endings. C. C. Speidel, Charlottesville, Va.—p. 625.
Development of Neurologic Surgery in New York City During Past Twenty-Five Years, with Remarks on Advances Due to Experiences in First World War. C. A. Elsberg, New York.—p. 654.
What Every Physician Should Know About Cross Examination. M. Sulzberger Jr., New York.—p. 665.
Sir Frederick Grant Banting. C. H. Best, Toronto, Canada.—p. 693.

Canadian Public Health Journal, Toronto

33:427-470 (Sept.) 1942

Health Services in the Secondary Schools. L. A. Pequegnat, Toronto.—p. 427.
Control of Tuberculosis in Wartime. G. J. Wherrett, Ottawa, Ont.—p. 438.
Diphtheria Toxoid and the Reinforcing Dose. J. R. Wilkey, London, Ont.—p. 446.
Outbreak of Acute Anterior Poliomyelitis in Okanagan Valley, B. C. J. M. Hershey, Kelowna, B. C.—p. 452.
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Endocrinology, Springfield, Ill.

31:393-480 (Oct.) 1942

Masculine Copulatory Behavior in Intact and Castrated Female Rats. F. A. Beach and Priscilla Rasquin, New York.—p. 393.
Effects of Endocrines on Age Changes in Epiphysial and Articular Cartilages. M. Silberberg and Ruth Silberberg, New York.—p. 410.
Problems Relating to Adrenal Cortex. D. J. Ingle, Kalamazoo, Mich.—p. 419.
Role of Adrenals in Production of Traumatic Shock in Rats. O. Hechter, L. Krohn and J. Harris, Los Angeles.—p. 439.
Relation of Thyroid to Mammary Gland Structure in Rat, with Special Reference to Male. J. F. Smithcors and S. L. Leonard, Ithaca, N. Y.—p. 454.
Relation of Mammogenic Lobule-Alveolar Growth Factor of Anterior Pituitary to Other Anterior Pituitary Hormones. J. P. Mixner, A. J. Bergman and C. W. Turner, Columbia, Mo.—p. 461.
Action of Diethylstilbestrol on Cytologic Characteristics of Anterior Pituitaries of Female Rats, Together with Certain Observations on Effect of Castration. J. M. Wolfe and A. D. Brown, Albany, N. Y.—p. 467.

Georgia Medical Association Journal, Atlanta

31:347-380 (Sept.) 1942

Cancer of Mouth. J. E. Scarborough Jr., Atlanta.—p. 347.
Joseph Jones, Surgeon C. S. A. J. Krafka Jr., Augusta.—p. 353.
Traumatic Abdomen: Special Reference to Nonpenetrating Injuries. H. L. Chevrs, Union Point.—p. 363.
Tuberculosis in General and Excerpts from 1941 Annual Report of the Division of Tuberculosis Control, Georgia Department of Public Health. H. C. Schenck, Atlanta.—p. 366.
*Vitamin B in Emesis and Hyperemesis Gravidarum. B. F. Hart, Winter Park, Fla., and R. Torpin, Augusta.—p. 368.

Vitamin B in Emesis and Hyperemesis Gravidarum.—Hart and Torpin treated nausea and vomiting of 37 women in early and late pregnancy with a product containing 5 mg. of thiamine hydrochloride, 5 mg. of riboflavin, 25 mg. of nicotinamide, 6 mg. of pyridoxine and 25 mg. of pantothenic acid to the tablet. The dose for 8 was one tablet three times a day; 7 were relieved in a week and 1 felt better but continued to vomit occasionally until delivery. Nicotinic acid in doses varying from 150 to 200 mg. a day was given 29; of these 8 obtained no relief, 8 were completely relieved, 9 were partially relieved and 4 were not followed sufficiently. Those who received partial relief stated that the vomiting had stopped but that some degree of nausea persisted. If these patients were not given the vitamin B tablets the vomiting would probably recur in about three weeks, despite the nicotinic acid. The vitamin B tablets were administered to 5 and their nausea completely disappeared. When relief was obtained the average patient usually noticed it about two days after starting medication. Most likely many of the patients had subclinical pellagra, as the diets of many were known to be borderline. Others probably had exhausted their vitamin B by vomiting. The metabolic increase and dietary perversions accompanying pregnancy probably served as precipitating factors.

Iowa State Medical Society Journal, Des Moines

32:445-482 (Oct.) 1942

Treatment of Raw Surfaces Resulting from Burns and Wounds. S. L. Koch, Chicago.—p. 445.
Use of Sulfonamides in: Pneumonia. H. J. Smith, Des Moines.—p. 450.
Id.: Infections of Genitourinary Tract. W. R. Hornaday, Des Moines.—p. 451.
Id.: Diseases of Eye, Ear, Nose and Throat. B. F. Kilgore, Des Moines.—p. 452.
Id.: Diseases of Digestive Tract. C. J. Peisen, Des Moines.—p. 453.
Use of Sulfonamides from Standpoint of Hematology. D. J. Haines, Des Moines.—p. 454.

Journal of Clin. Endocrinology, Springfield, Ill.

2:539-576 (Sept.) 1942

*Treatment of Simmonds' Disease. R. H. Williams and J. L. Whittenberger, Boston.—p. 539.
Experimental Modification of Water and Salt Output in Patients with Diabetes Insipidus. T. H. McGavack, L. J. Boyd and P. Gelvin, New York.—p. 551.
*Use of Testosterone Propionate and Estrogenic Substance in Treatment of Essential Hypertension, Angina Pectoris and Peripheral Vascular Disease. T. C. Walker, Beaumont, Texas.—p. 560.
Sublingual Administration of Diethylstilbestrol: Comparison of Routes in Therapy. D. Castrodale, Ellen Loeffel and C. M. MacBryde, St. Louis.—p. 569.
Spermatozoal Stain for Clinical Studies. W. K. Cuyler and Margaret Baptist, Durham, N. C.—p. 571.

Treatment of Simmonds' Disease.—Williams and Whittenberger treated 5 unselected cases of Simmonds' diseases with thyroid extract, desoxycorticosterone acetate, sodium chloride and testosterone. The patients had had their disease for five to twenty years. None of the patients had had any sexual activity for several years. The 4 women had had amenorrhea for a long time but none had experienced menopausal reactions. All had clearcut symptoms of myxedema. Contrary to the usually expected characteristic cachexia, not 1 of the patients was cachectic. There was little, if any, axillary or pubic hair, and essentially no hair on the trunk. There was no atrophy of the breasts. Most of the difficulty was encountered in estimating the number of pellets of desoxycorticosterone acetate which was necessary. At the time of discharge the number of 125 mg. pellets of desoxycorticosterone acetate used varied from one to six. One patient was discharged with instructions for taking 3 Gm. of salt daily, another was taking 8 Gm. daily, while none was prescribed for the other 3. The initial dose of thyroid was ½ grain (0.032 Gm.), and this was increased until, by clinical observation and according to the basal metabolic rate, there was no evidence of thyroid insufficiency. The ultimate dose varied from ½ to 2 grains (0.032 to 0.13 Gm.). The more the thyroid was increased, the more the desoxycorticosterone acetate had to be increased. The use of enough testosterone in women to secure an increase in strength, energy and general well being without masculinization was usually one or two pellets (150 mg. each). The dose for the male was governed by these general reactions and by the amount of sexual stimulation. Three pellets were required. Each patient took small amounts of food between meals and at bedtime to distribute the supply of carbohydrates evenly over the twenty-four hours, thereby preventing hypoglycemic reactions. In all the blood pressure, basal metabolic rate and serum sodium returned to and have remained normal. The myxedematous manifestations have disappeared. Their mental state has changed from a dull, irritable and depressed level to an alert and cheerful one. None of the symptoms of adrenal

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insufficiency have reappeared. Of the 3 patients with normocytic and normochromic anemia who had not responded to iron or liver, the anemia has disappeared in 2. In no case was there enough overgrowth of hair to cause concern.

Hormone Preparations and Blood Vascular Disorders.—Walker reports the results of treating 82 persons with androgenic and estrogenic substances. Fifty-six patients had essential hypertension, 12 angina pectoris and 14 organic peripheral vascular disease. In the entire group of hypertensive patients, treatment with gonadotropic substances has resulted in a more pronounced and more prolonged lowering of the blood pressure than was usually obtained by other medical methods. Moreover, the effect of these substances on occlusive peripheral vascular disease and angina pectoris is further indicative of their pronounced vasodilating action. Subjective improvement was more evident than is usually observed following other therapeutic methods. The data favor the concept of a direct vasodilating action of the hormone preparations although not in keeping with the fact that the blood pressure is occasionally elevated in hypotensive persons as a result of gonadotropic therapy. While the gross mechanism by which the hormone preparations favorably influence vasospastic phenomena is obviously vasodilatation, the finer mechanism may be the establishment of an endocrine balance.

Journal of Clinical Investigation, New York

21:511-650 (Sept.) 1942

Specific Antipneumococcic Immunity in Relation to Chemotherapy of Pneumonia. W. S. Tillett, with assistance of Margaret J. Cambier and H. Dunn, New York.—p. 511.
Studies on Blood Coagulation: Proteolytic Enzyme Prepared from Calcium and Platelet Free Normal Human Blood Plasma. H. J. Tagnon, C. S. Davidson and F. H. L. Taylor, Boston.—p. 525.
Id.: Nature and Properties of Proteolytic Enzyme Derived from Plasma. M. H. Kaplan, H. J. Tagnon, C. S. Davidson and F. H. L. Taylor, Boston.—p. 533.
Digital Blood Flow, Arterial Pressure and Vascular Resistance in Arterial Hypertension and in Coronary Thrombosis. M. Mendlowitz, New York.—p. 539.
Digital Circulation in Peripheral Vascular Diseases. M. Mendlowitz, New York.—p 547.
Measurement and Recording of Gastroduodenal Blood Flow in Man by Means of Thermal Gradientometer. C. H. Richards, S. Wolf and H. G. Wolff, New York.—p. 551.
Adrenal Cortical Hyperplasia with Virilism: Diagnosis, Course and Treatment. N. B. Talbot, A. M. Butler and R. A. Berman, Boston.—p. 559.
Electrophoretic Study of Protein Components in Cerebrospinal Fluid and Their Relationship to Serum Proteins. E. A. Kabat, D. H. Moore and H. Landow, New York.—p. 571.
*Observations on Nature of Myasthenia Gravis: Effect of Thymectomy on Neuromuscular Transmission. A. M. Harvey, J. L. Lilienthal Jr. and S. A. Talbot, Baltimore.—p. 579.
Effects Produced by Intravenous Injection in Man of Toxic Antigenic Material Derived from Eberthella Typhosa: Clinical, Hematologic, Chemical and Serologic Studies. G. O. Favorite, Philadelphia, and H. R. Morgan, Boston.—p. 589.
Production of Cardiac Lesions by Repeated Injections of Desoxycorticosterone Acetate. D. C. Darrow and H. C. Miller, New Haven, Conn.—p. 601.
Velocity of Blood Flow in Infants and Young Children Determined by Radioactive Sodium. J. P. Hubbard, Boston; W. N. Preston and R. A. Ross, Cambridge, Mass.—p. 613.

Myasthenia Gravis, Effect of Thymectomy.—The state of neuromuscular transmission and the effect of prostigmine methylsulfate and acetylcholine injected into the brachial artery of 5 patients with severe myasthenia gravis five months after total thymectomy has been studied by Harvey and his associates. The partial block in neuromuscular transmission and the abnormal reactions to the intra-arterial injection of prostigmine methylsulfate which existed preoperatively were altered profoundly. The results indicate that in myasthenia gravis the thymus influences greatly the function of the motor nerves and the striated muscles which they innervate. The data furnish objective evidence of the normal physiologic function of the thymus. In addition to changes in the physiologic and pharmacologic patterns of neuromuscular function which followed thymectomy, an extraordinary clinical improvement ensued in 3 patients concomitantly with the reversion of neuromuscular function toward normal. Local fasciculations developed following the intra-arterial injection of prostigmine methylsulfate; the muscle action potential, in response to a maximal motor nerve stimulus, increased enormously, indicating that more muscle fibers were excited; the characteristic depression of neuromuscular function following activity at the junction was eliminated or greatly diminished; the response to a single stimulus after the injection of prostigmine methylsulfate became repetitive as in the normal subject; in 2 patients a normal depression of neuromuscular function developed after the intra-arterial injection of prostigmine methylsulfate and in 1 the muscle threshold rose after injection of acetylcholine into the brachial artery. The evidence indicates that in certain individuals the thymus plays an important role in the pathogenesis of myasthenia gravis. The changes after thymectomy indicate an increase in the amount of transmitter substance available at the neuromuscular junction.

Journal of Immunology, Baltimore

44:271-344 (Aug.) 1942

Studies on Specific Mechanism of Serum Sickness: I. Passive Serum Sickness. S. Karelitz and S. S. Stempien, New York.—p. 271.
Id.: II. Prevention and Modification of Serum Sickness with Human Serum Sickness Convalescent Serum (S. S. C. S.). S. Karelitz, New York.—p. 285.
Ascorbic Acid and Immunity: I. Relation of Ascorbic Acid to Human Complement. W. W. Spink, Suzanne Agnew and O. Mickelsen, Minneapolis.—p. 289.
Id.: II. Relation of Ascorbic Acid to Guinea Pig Complement. Suzanne Agnew, W. W. Spink and O. Mickelsen, Minneapolis.—p. 297.
Id.: III. Effect of Ascorbic Acid on Bactericidal Action of Human Blood. W. W. Spink, Suzanne Agnew, O. Mickelsen and LaMeta Dahl, Minneapolis.—p. 303.
Tetanus Immunization: Effectiveness of Stimulating Dose of Toxoid Under Conditions of Infection. B. Zuger, C. K. Greenwald and H. Gerber, New York.—p. 309.
Two New Salmonella Types with Related Specific Antigens. P. R. Edwards and D. W. Bruner, Lexington, Ky.—p. 319.
Absorption of Bacterial Antigen from Diphtheric Toxin and Toxoid by Magnesium Hydroxide. I. A. Parfentjev, A. Waldschmidt and A. J. Weil, Pearl River, N. Y.—p. 325.
Use of Radioactive Phosphorus as Tracer in Hemolytic Streptococci: I. Detection of Assimilated Radioactivity in Treated Fractions of Sonically Vibrated Organisms. O. A. Ross, Philadelphia.—p. 329.

Journal of Infectious Diseases, Chicago

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Tissue Distribution of Exoerythrocytic Schizonts in Sporozoite Induced Infections with Plasmodium Cathemerium. R. J. Porter, Chicago.—p. 1.
Schizogony and Gametocyte Development in Leukocytozoon Simondi and Comparisons with Plasmodium and Hemoproteus. C. G. Huff, Chicago.—p. 18.
Histopathologic Study of Mode of Action of Sulfapyridine. C. C. Lushbaugh and P. R. Cannon, Chicago.—p. 33.
*Tyrothricin Therapy of Experimental Hemolytic Streptococcus Empyema. C. H. Rammelkamp, Boston.—p. 40.
Observations on Reversibility of Quellung Reaction and Relation Between Quellung Reaction and Bile Solubility. Alice H. Kempf and W. J. Nungester, Ann Arbor, Mich.—p. 50.
Consideration of Respiratory Pattern as Predisposing Factor in Etiology of Pneumonia. W. J. Nungester, R. G. Kleposer and Alice H. Kempf, Ann Arbor, Mich.—p. 57.
Serologic and Biologic Classification of Hemolytic and Nonhemolytic Streptococci from Human Sources. L. A. Rantz, San Francisco.—p. 61.
Effect of Temperature on Growth and Survival of Myxoma, Herpes and Vaccinia Viruses in Tissue Culture. R. L. Thompson and Margaret S. Coates, Cleveland.—p. 83.

Therapy of Experimental Streptococcic Empyema.—Tyrothricin, a bactericidal substance derived from a strain of group A hemolytic streptococcus obtained from the blood stream of a patient with erysipelas who subsequently died and the virulence of which increased for rabbits by frequent animal passage, was used by Rammelkamp in the treatment of streptococcic empyema in rabbits. The experiments demonstrated that the pleural cavity of rabbits could be sterilized by the injection of 3 to 40 mg. of the bactericidal substance. The tyrothricin was administered as a single injection at the time of infection or up to eighteen hours later. Occasionally an animal died if treatment was delayed. Death of these animals was due to extension of the infection to the pericardium and the opposite pleural cavity before tyrothricin therapy was instituted, since the treated cavity was sterile at postmortem examination. Staphylococcic infections of the pleural cavity were somewhat more resistant to this therapy. The tyrothricin produced certain local toxic effects which would be undesirable if the substance was to be employed for treating human infec-

tion. Perhaps many of the toxic reactions may be avoided by using a more purified extract. The two active crystalline substances gramicidin and tyrocidine separated from tyrothricin may be less toxic. Gramicidin, which is more bactericidal than tyrocidine or tyrothricin, comprises less than half the total weight of the crude substance tyrothricin. Its toxic effects have not been thoroughly investigated, but it is safe to say that it is less toxic for erythrocytes, leukocytes and tissue in general than tyrocidine or tyrothricin. The results suggest that gramicidin may prove useful in treating empyema.

Journal of Lab. and Clinical Medicine, St. Louis

27:1495-1636 (Sept.) 1942

Prevention of Porphyrin Incrustations on Pantothenic Acid Deficient Rats by Harderian Gland Ablation. F. H. J. Figge and K. Salomon, Baltimore.—p. 1495.

Duodenal Bulb ("Ulcer Bearing Area") Acidity in Fasting Normal People. J. E. Berk, M. E. Rehfuss and J. E. Thomas, Philadelphia. —p. 1501.

Acute Postoperative Lung Abscess: Report of Case with Unusual Bacteriologic Findings. A. Strelinger, Elizabeth, N. J.—p. 1510.

*Benzene Poisoning in Industry. R. H. Wilson, Akron, Ohio.—p. 1517.

*Blood Pattern as Clue to Diagnosis of Malignant Disease. H. L. Bolen, Fall River, Mass.—p. 1522.

Blood Pressure Fluctuations in Respiratory Obstruction: Experimental Observations. H. Osgood, Buffalo, with technical assistance of R. S. Berkson, D. W. Hall, M. E. Kinal and A. S. Lenzner.—p. 1536.

*Treatment of Severe Periodic Headaches with "Desensitizing" Doses of Prostigmine: New Conception and Treatment of Certain Types of Headaches Including Those Designated as Migraine and Histamine Headaches. L. Pelner and M. E. Aibel, Brooklyn.—p. 1546.

Observations on Effect of Histamine Phosphate on Capillary Permeability and Inflammation. R. H. Rigdon, Memphis, Tenn.—p. 1554.

Cholesterol Studies in the Aged. H. A. Rafsky and B. Newman, New York.—p. 1563.

Sulfonamide Solubility in Urea. S. S. Sobin, St. Louis.—p. 1567.

Benzene Poisoning in Industry.—The national defense program, altering industry to suit its needs, Wilson states, has placed increasing burdens on the industrial physician, especially in the rubber industry with its increased use of benzene and its physical hazards. Poisoning from it is due to absorption by the respiratory, alimentary or cutaneous route. The statistics of a factory in the rubber industry that has been using benzene in small quantities for years show that, with the advent of large war orders and the increasing use of synthetic rubber, workers came to the company hospital with complaints of malaise, nausea and vomiting, and a few with bleeding. Immediate blood counts were done on the 1,104 people using benzene; in 83, or 7.5 per cent, there were mild blood changes and symptoms of slight absorption of benzene fumes. Twenty-five, or 2.2 per cent, showed severe blood changes with symptoms of severe benzene intoxication; 9 of these 25 were hospitalized and received from two to fifty blood transfusions. Three of the 9 died. This low mortality incidence was believed to be due to the extreme amount of treatment received, consisting of multiple whole blood and direct bone marrow transfusions, and liver, iron, calcium, phosphorus, yellow bone marrow and multiple vitamin therapy. Prophylactic measures include adequate ventilation and constant medical supervision; that is, frequent blood examinations. Frequent air samples should be tested with a combustible gas indicator and ventilation introduced to keep the concentration of benzene in the air below one hundred parts per million. No one should be permitted to work in a benzene department with a leukocyte count below 5,000 or one above 13,000. After ten days of employment the employee should be given a urinary sulfate test; if the ratio is below 50 a tendency to absorption exists and the employee should be removed from the benzene department. Also a drop of 25 per cent in any blood component is sufficient reason for removal. An ideal arrangement would be repeated blood checks on exposed employees.

Blood Pattern and Malignant Disease.—Bolen used the Goldberger sedimentation test on the blood of every patient to see whether it would afford material aid in diagnosis, prognosis and therapy. The most interesting phenomenon was the distinctive pattern of the blood obtained from patients with cancer. The pattern characteristic of blood from normal subjects and patients with ulcer, inflammatory disease and the like was devoid of meshwork. There was no breaking up of the fibrin; the blood was more compact. In the central part of each drop of blood there was a dark agglutinated mass. Invariably the pattern formed by blood from cancerous patients was what he describes as the "dotted curtain" type. Peripheral rings were absent and no agglutinated mass was seen in the center. The blood was broken down into "dots." Under the microscope the cancerous blood showed numerous three cornered triasteroid spicules scattered throughout. These spicules or rays were not found in any other condition in such abundance. In acute rheumatic fever, rheumatoid arthritis, active tuberculosis, pregnancy, pernicious anemia and coronary disease a positive pattern was also obtained, but in all of these the clinical observations differentiated the condition from cancer and furthermore the positive reaction gradually changed to negative as proper treatment was instituted. This same transition from a positive to a negative blood pattern occurred when "cures" were obtained in cancer patients, either by total surgical extirpation, radium implantation or high voltage roentgen therapy. Of the 132 patients that the author has encountered since 1939 and noted the type of blood pattern, he noticed a positive reaction in only two conditions: diverticulitis and endometriosis. The margin of error was only 1.5 per cent. Slides of 140 patients with proved cancer show one hundred and twenty-eight to be positive and twelve to be negative. The erythrocyte count, the leukocyte count and the hemoglobin appeared to have no relationship to the carcinoma blood pattern on the slide. The test is offered as an adjunct to be evaluated along with clinical and laboratory observations. Sometimes this cancer pattern can be the sole evidence of the presence of a malignant condition leading to a more thorough study of the patient.

Treatment of Periodic Headaches with Prostigmine Bromide.—Pelner and Aibel undertook the present study of the treatment of histamine headaches (reproduced by histamine injections and controlled by desensitizing the patient with small but increasing doses of histamine) after they had observed that several weeks subsequent to the cessation of histamine desensitization therapy of a patient with a typical histamine headache an attack was promptly aborted by one tablet of prostigmine bromide. Some time later, when desensitization had apparently lapsed, similar treatment with prostigmine produced a typical severe cephalalgia, accompanied by fulness in the back of the head, diarrhea, abdominal cramps and a mild attack of wheezing. It appears that prostigmine duplicated the action of histamine in both the desensitized and sensitized phases. The effect of prostigmine bromide on headaches of the migraine and histamine types was investigated on 20 patients with more or less typical histamine cephalalgias, 25 with the "migraine" type, 8 who complained of a constant tightness and fulness in the back of the neck and 7 with hypertension with pounding of the vertex of the skull, fulness or tightness in the neck muscles and the fulness in the head and ears. The common denominator was a decided cutaneous sensitivity to histamine and/or acetylcholine. It was hoped to "desensitize" these patients by the oral administration of increasing doses of prostigmine bromide. Accordingly, 15 mg. of prostigmine bromide was dissolved in 1 ounce (30 cc.) of water and administered as follows: On the first day, respectively 1, 2 and 3 drops were given at morning, noon and night. The increase of 1 drop per dose was maintained until 30 drops was reached, after which 30 drops was given each day for one week and then three times a week for an indefinite period. When it was felt that the results could be improved the dose was increased to 40 drops. The patients had skin tests with histamine before treatment was instituted, and repeat tests were made every week or every two weeks. In 40 per cent the cutaneous reaction to injected histamine decreased with "desensitizing" doses of prostigmine. Patients with definite periodic headaches of the histamine and migraine type had a definite and dramatic relief and in many it was complete for the time they were observed. Several patients observed that if a mild headache did occur it could be dispelled in a few minutes by 15 drops of the solution. The fulness in the head and the feeling of tightness of the neck muscles described by patients with hypertension were relieved in several. The pounding of the vertex of the skull, ascribable to the hypertension, was not improved.

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Journal of Pharmacology & Exper. Therap., Baltimore

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Myocardial Necrosis and Fibrosis Resulting from Administration of Massive Doses of Cardiac Glycoside. J. S. LaDue, Minneapolis. —p. 1.

Drug Prophylaxis Against Lethal Effects of Severe Anoxia: III. *d-*, *l-* and *dl*-Phenisopropylamines. G. A. Emerson, Morgantown, W. Va.—p. 11.

Nitrites: VIII. Blood Nitrite Content of Man and Other Species. M. Rath and J. C. Krantz Jr., Baltimore.—p. 27.

*Effect of Carminatives on Emptying Time of Normal Human Stomach. E. J. Van Liere and D. W. Northrup, Morgantown, W. Va.—p. 39.

Stable Anesthetic Solutions of Barbituric Acids. M. T. Rush, H. L. Dickison and P. D. Lamson, Nashville, Tenn.—p. 44.

Studies of Influence of Prostigmine on Morphine Addiction. C. K. Himmelsbach, F. W. Oberst, R. R. Brown and E. G. Williams, Lexington, Ky.—p. 50.

Studies on Toxicity and Pharmacology of Riboflavin. K. Unna and J. G. Greslin, Rahway, N. J.—p. 75.

Cortical Effects of Demerol. H. L. Andrews, Lexington, Ky.—p. 89.

Carminatives and Gastric Emptying.—Van Liere and Northup observed in a controlled study that 1 cc. of fluidextract of ginger U. S. P. XI given to 6 subjects in a suitable test meal significantly decreased the emptying time in 1 but not in the others. Tincture of capsicum U. S. P. XI given to 3 subjects in doses of 0.5 cc. and to 6 subjects in doses of 1 cc. caused a significant decrease in the gastric emptying time of 1 subject, but that of the others was relatively unaffected. A dose of 0.3 cc. of oil of peppermint U. S. P. XI showed neither a significant increase nor a decrease in the gastric emptying time of 6 subjects. These representative carminatives may influence gastric emptying in certain subjects, but probably the emptying time of most individuals is not appreciably affected by moderate doses.

Journal of Urology, Baltimore

48:231-342 (Sept.) 1942

Interpretation of Renal Function Tests in Surgery. M. Fishberg, Brooklyn.—p. 231.

Extensive Bilateral Pyeloureterocystitis Cystica and Glandularis Producing Pyonephrosis-Nephrectomy: Report of Cases. W. C. Stirling, Washington, D. C.—p. 237.

*Modes of Origin of Dystopic Tissues, with Special Reference to Problem of Hypernephroma. P. Gruenwald, Chicago.—p. 244.

Crossed Renal Ectopia Without Fusion: Report of Fourth Case, Transperitoneal Pyelotomy. A. Harris, Brooklyn.—p. 252.

Ureteral Calculus Extractor. C. Ferguson, Stapleton, N. Y.—p. 256.

Proliferation of Glands of Urinary Bladder Simulating Malignant Neoplasm. J. L. Emmett and J. R. McDonald, Rochester, Minn. —p. 257.

Treatment of Ruptured Bladder and Urethra: Analysis of Eighty-Six Cases of Urinary Extravasation. O. S. Culp, Baltimore.—p. 266.

Radical Perineal Prostatectomy in Early Carcinoma of Prostate. E. Belt, Los Angeles.—p. 287.

Relationship of Circumcision to Cancer of Prostate. A. Ravich, Brooklyn.—p. 298.

Urinary Concretions: II. Study of Primary Calculous Lesions. L. C. Posey, Birmingham, Ala.—p. 300.

*Fatal Human Case of Urolithiasis Medicamentosa Caused by Sulfadiazine. A. Rottino and O. La Rotonda, New York.—p. 310.

The Traumatic and Toxic Production of Urinary Calculi in Animal Experiment. W. Grossmann, Hartford, Conn.—p. 318.

Radiographic Demonstration of Hydrocele. S. E. Last, New York. —p. 322.

Hemolytic Streptococci from Genitourinary Infections. A. Hollander, Brooklyn.—p. 328.

Further Neurologic Studies by Means of Microcystometer and Sphincterometer: X. Studies in Bladder Function. I. Simons, New York.—p. 331.

Origin of Dystopic Tissues.—In explaining the genesis of anomalous tissue it is desirable to see the condition as close as possible to the period of its origin. Gruenwald describes the abnormally located tissue in 2 human embryos of the third month. The two possibilities of development, aberrant growth of a primordium from its normal point of origin and differentiation of an accessary focus from cells distant from the normal primordium of dystopic tissue, were represented by the 2 specimens. The occurrence of corticoadrenal foci in the mesonephros was illustrated by a third embryo. The study of the several types of dystopic tissue in the 3 embryos does not permit a general answer to the question of the origin of the anomaly. The developmental physiology of the tissue concerned and the region in which it is found will in most cases allow a decision between aberrant germs growing into their abnormal surroundings from a normally located primordium, and abnormal differentiation of the local tissue gifted with the necessary developmental potencies. The latter alternative suggests a close association or mingling of tissue normally not related to each other. Consideration of the hypernephroma problem along these lines leads to the conclusion that a tissue with true corticoadrenal characteristics may well originate from originally normal renal cells. A definite and all inclusive classification of the hypernephroma as a renal or adrenal tumor is therefore neither possible nor desirable.

Fatal Sulfadiazine Urolithiasis.—Rottino and La Rotonda report the first occurrence of uroliths in a human being following oral sulfadiazine therapy for pneumonia. The patient died on the twelfth hospital day of uremia caused by intrarenal disease and bilateral blockage of the ureters by crystals, which were also deposited in the pelvis and calix of each kidney. Crystalline matter distended the tubules and caused injury to their lining epithelium. Analysis revealed that practically all the deposit was acetyl sulfadiazine, which, unlike the free form of the drug, was firm, gritty, sharp and irritating. In addition to the presence of the precipitate matter there was bilateral pyelonephritis. Sections stained for bacteria showed no organisms. Although it is not the authors' intention to ascribe the pyelonephritis to the drug, it is probable that it caused injury to tubular epithelium and was then followed by the reactive phenomenon. That there was a relationship between the tubular damage and some of the inflammatory reaction is supported by the microscopic picture, which consisted in swelling of some tubular epithelial cells, flattening of others, loss of cells with resulting ulceration, adhesion over areas of coagulum, infiltration of the latter with cellular exudate, and extension of the exudate through the tubule into the surrounding interstitium. Whether the reaction is due to the drug, to stagnant urinary products, to undisclosed bacteria or to their products is not possible to answer.

Kansas Medical Society Journal, Topeka

43:369-404 (Sept.) 1942

Some Nutritional Problems of Neonatal Period. A. Brown, Toronto, Canada.—p. 369.

Contacts of the Law with Medical Practice. L. G. Allen, Kansas City. —p. 374.

Replacement Therapy in Achlorhydria: Clinical Study. G. A. Westfall and B. C. Gradinger, Halstead.—p. 380.

Chronic Peptic Ulcer in Childhood: Report of Case. S. W. Raymond, Chicago.—p. 382.

Laryngoscope, St. Louis

52:675-756 (Sept.) 1942

Bone Conduction in Audiometry: I. Literature Review and Report of Preliminary Observations. B. H. Senturia and A. R. Thea, St. Louis.—p. 675.

Acute Suppurative Mastoiditis in Geriatrics. J. B. Farrior, Ann Arbor, Mich.—p. 688.

Therapeutic Effect of Bismuth in Infectious Mononucleosis: Preliminary Statement; Report of Two Cases. M. Saltzman, Philadelphia.—p. 697.

Otolaryngologic Aspects of Aviation. L. D. Carson, Washington, D. C. —p. 704.

Studies of Deafness in Twins: Otosclerosis in Identical Twins; Three Case Histories. E. P. Fowler, New York.—p. 718.

Meningioma with Unusual Involvement of Temporal, Sphenoid and Occipital Bone. O. C. Risch, New York.—p. 732.

Otogenic Complications: Discussion of Literature for 1941. L. G. Richards, Boston.—p. 745.

Medicine, Baltimore

21:207-344 (Sept.) 1942

*Natural History of Laënnec's Cirrhosis of Liver: Analysis of 386 Cases. O. D. Ratnoff and A. J. Patek Jr., New York.—p. 207.

Clubbing and Hypertrophic Osteoarthropathy. M. Mendlowitz, New York.—p. 269.

Recent Advances in Epidemiology of Pneumococcic Infections. M. Finland, Boston.—p. 307.

Laënnec's Cirrhosis.—Ratnoff and Patek reviewed the data of eight hundred charts from five New York hospitals on which the diagnosis of "cirrhosis of the liver" appeared. The records of 386 patients showed adequate clinical evidence of cirrhosis. In 178 of these the diagnosis was established by microscopic examination of surgical or postmortem specimens, 208 were classified as presumptive cases with a palpable liver and spleen, signs of collateral venous circulation, jaundice, ascites, roentgen

signs of esophageal varices, hematemesis and laboratory tests revealing abnormal hepatic function. Certain antecedent or predisposing factors were noticed; there was an increased incidence of cirrhosis in patients of Italian and Irish stock, there was no convincing evidence of hereditary predisposition and the disease was acquired in late middle life by men two to three times as often as by women. This last factor is probably explained by the higher incidence of alcoholism in men. A coexisting nutritional deficiency may be postulated by the higher incidence of the disease in alcoholism, malaria and enteric fevers. A past history of acute hepatitis, exposure to hepatotoxins, diabetes mellitus and thyroid disease are predisposing factors of lesser importance. The most characteristic initial symptoms of Laënnec's cirrhosis were abdominal swelling and pain, anorexia, nausea, vomiting and flatulence. Other frequent symptoms were weight loss, hematemesis, epistaxis, dyspnea, nocturia, frequency and sexual disturbances. The spleen, palpable in half of the patients during life, is enlarged in about 80 per cent at necropsy. The high incidence of peripheral neuritis and of mental changes is probably due to the coexisting nutritional deficiency. Fever was present in 24 per cent of the series. Chief complications were intercurrent infection, anemia, abdominal hernia, peptic ulcer and portal vein thrombosis. The prognosis is grave after signs of decompensation appear; after ascites 47 per cent survive six months and only 32 per cent for one year; after jaundice 44 per cent live six months and 26 per cent for one year, and after hematemesis 45 per cent live six months and 28 per cent for one year. The chief causes of death were cholemia, hematemesis, postoperative complications, pneumonia and intercurrent infections.

Missouri State Medical Assn. Journal, St. Louis

39:301-332 (Oct.) 1942

Clinical Diagnosis of Cancer of Breast. A. P. Stout, New York. —p. 301.
Three Important Advances in Obstetric Therapy. W. R. Cocke, Galveston, Texas.—p. 303.
Treatment of Bright's Disease. I. H. Page, Indianapolis.—p. 306.
Principles in Treatment of Burns. O. Cope, Boston.—p. 310.
Problems in Treatment of Lesions of Biliary Tract. W. Walters, Rochester, Minn.—p. 314.
Role of Psychiatrist in Army Induction Program. S. R. Warson, St. Louis.—p. 318.

Nebraska State Medical Journal, Lincoln

27:333-368 (Oct.) 1942

Special Problems in Diagnosis and Treatment of Peptic Ulcer. E. D. Kirfer, Boston.—p. 333.
Chemotherapy of Respiratory Diseases. L. T. Hall, Omaha.—p. 339.
Cardiology as Related to Military Medicine: I. Consideration of Certain Cardiac Findings and Lesions. F. W. Nichaus, Omaha. —p. 343.
War Casualties at Home and Abroad. C. W. McLaughlin Jr., Omaha. —p. 346.
Office Treatment of Anorectal Fistulas. L. E. Moon, Omaha.—p. 350.
Colic in Infants. C. Moore, Omaha.—p. 353.
The Cass-Sarpy Counties Public Health Program. L. E. Kling, Bellevue.—p. 356.

New England Journal of Medicine, Boston

227:363-394 (Sept. 3) 1942

Six Years' Experience of Thyroid Service at the Massachusetts Memorial Hospitals. H. L. Albright and H. M. Clute, Boston.—p. 363.
The Physician Prepares to Enter the Army. R. M. Sullinger and M. A. Freedman, Boston.—p. 370.
Experimental Application of Sulfonamide Drugs to Cerebral Cortex. F. D. Ingraham and E. Alexander, Boston.—p. 374.
Virus Pneumonias: II. Primary Atypical Pneumonias of Unknown Etiology. J. H. Dingle and M. Finland, Boston.—p. 378.

227:395-426 (Sept. 10) 1942

Rheumatoid Arthritis Associated with Splenomegaly and Leukopenia. R. H. Talkov, W. Bauer and C. L. Short, Boston.—p. 395.
Urinary Typhoid Carriers: Report of Case. W. T. Buddington and B. B. Gilman, Boston.—p. 400.
*Further Experience with Electric Shock Therapy in Mental Disease. A. Myerson, Boston.—p. 403.
Radiation Therapy. R. Dresser, Boston.—p. 410.

Electric Shock Therapy in Mental Disease.—Myerson reports the results of treating 123 patients, 74 by the "outpatient method"—that is, the patients reported at a place fitted out in hospital fashion with nurses and a physician in attendance, were given the shock treatment and usually went home within one or two hours. If the patient was too disturbed after treatment to return home he was transferred to a hospital for mental diseases to complete the treatment. Two patients could not return home because of injury. Outpatient care of many psychiatric patients is useful, as it often makes commitment unnecessary and is with proper safeguards as safe as inpatient care. The risk of cerebral damage by electric shock is fundamentally inconsequential when compared with the conditions treated. Electric shock is a mild procedure when compared with hypothermia, hyperthermia, lobotomy and lobectomy. Injuries have been greatly reduced. The commonest complication is fracture of a vertebral transverse process. Only 1 such fracture occurred among the 123 patients. Three cases of subdeltoid bursitis which had occurred responded to physical therapy. The most unusual injury was fracture of both acetabulums, with displacement of the heads of the femurs into the pelvis in a woman of 50, who is still under treatment. It may be of value to study the amount of calcium in the blood and the bony structure of the pelvis in certain cases. Mental disease usually warrants the treatment even when moderate organic disease of the heart and other organs is present. Electric shock treatment is of little value for the fully developed schizophrenic state, with splitting of personality, hallucinations, delusions of reference and negativistic or catatonic reactions—especially when the condition has lasted for years. It is of little advantage for paranoid psychosis and obsessive compulsive neurosis. In involutional melancholia, senile melancholia, manic-depressive psychosis, chronic depression and anxiety neurosis, that is a condition in which disturbance in affect or mood is the main psychopathologic feature, electric shock treatment is likely to bring about definite improvement, recovery or at least remission.

New Orleans Medical and Surgical Journal

95:157-210 (Oct.) 1942

Roentgen Diagnosis of Acute Intestinal Obstruction. M. D. Teitelbaum, New Orleans.—p. 157.
Military Medicine: The Medical Profession and Selective Service in Louisiana. F. P. Rizzo, New Orleans.—p. 169.
Id.: Dental Deficiencies and Rehabilitation of Selectees. L. J. Schoeny, New Orleans.—p. 171.
Id.: Medicine in Aviation. J. E. Fulghum, New Orleans.—p. 174.
Use of Sulfonamides in Acute Infections. D. B. Barber, Alexandria, La.—p. 178.
Use of Deproteinated Pancreatic Extract in Treatment of Ureteropasm. H. W. E. Walther and R. M. Willoughby, New Orleans.—p. 182.
Physiologic Concept of Tissue Resistance in the Surgical Diabetic. L. S. Charbonnet Jr. and G. F. Schroeder, New Orleans.—p. 187.
Impressions of Venezuela. Vera Morel, New Orleans.—p. 194.

Pennsylvania Medical Journal, Harrisburg

45:1249-1448 (Sept.) 1942

Sulfonamide Drugs in Dermatology. L. A. Brunsting, Rochester, Minn.—p. 1261.
More Effective Choice of Selectees from Standpoint of National Headquarters. L. G. Rowntree, Washington, D. C.—p. 1267.
Multiple Primary Malignant Neoplasms. I. L. Ohlman and K. Y. Yardumian, Pittsburgh.—p. 1271.
Nonspecific Urethritis in Male. J. D. Denney, Columbia.—p. 1276.
Clinical Value of Heart Sound Tracings with Electrocardiogram. A. Koenig and E. W. Young, Pittsburgh.—p. 1279.
Recent Advances in Cataract Surgery: Analysis of Some Newer Procedures. L. C. Peter, Philadelphia.—p. 1288.
Treatment of the Epileptic Child. D. S. Polk, Rosemont.—p. 1293.
*Weil's Disease: Incidence, Diagnosis and Treatment: Report of Two Cases. D. W. Kramer, Philadelphia.—p. 1298.

Weil's Disease.—Kramer suggests that the disparity between the incidence figures for Weil's disease in the United States and those given for certain European and Asiatic countries may be a lack of interest in the disease in this country, failure to make an accurate diagnosis and neglect in reporting authentic and recognized cases. Those interested in the subject believe that Weil's disease occurs in the United States much more frequently than the following figures indicate: 23 authentic cases from 1922 to 1940 as compared to 374 for Holland between 1924 and 1938, 248 for Britain since 1922 and similar reports for Norway, Japan, France and other countries. The figures for the United States would be increased if suspected cases were thoroughly studied and investigated by modern laboratory methods. The medical profession must become "Weil's disease

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conscious" if it is to diagnose these cases, because the disease does not always appear with the classic symptoms. Negative reports of dark field illumination or cultures of the urine and blood should not deter further investigation. The spinal fluid may reveal leptospiras. Complement fixation and agglutination tests have been improved and are helpful in making the diagnosis when other studies fail to reveal the organism. A search for leptospiras in sections obtained at necropsy is also suggested. In 1 of the 2 cases of Weil's disease reported, the diagnosis was based on the clinical picture, history of exposure, presence of similar cases in the community and positive agglutination and complement fixation tests; in the other the diagnosis was made by finding leptospiras in the urine and in sections of the spleen at necropsy. The disease should be a reportable infection. The listing of patients who have recovered from the disease and who are willing to act as donors for immune serum for persons severely ill is suggested.

Public Health Reports, Washington, D. C.

57:1399-1438 (Sept. 18) 1942

Frequency and Volume of Hospital Care for Specific Diseases in Relation to All Illnesses Among 9,000 Families, Based on Nationwide Periodic Canvasses, 1928-1931. S. D. Collins.—p. 1399.

Review of Gastroenterology, New York

9:335-392 (Sept.-Oct.) 1942

Sprue Syndrome: General Considerations. J. L. Kantor, New York.—p. 335.

Blood Picture in Sprue. H. B. Shookhoff, New York.—p. 338.

Hemorrhagic Tendency in Sprue. J. M. Alper, New York.—p. 340.

Urine Analysis in Gastroenterology. L. Lichtwitz, New York.—p. 343.

Esophageal-Hiatus Hernia. D. Young, New York.—p. 345.

Improved Continuous Drip Apparatus, with Special Reference to Use of Alumina Gels in Therapy of Peptic Ulcer. A. Cornell and F. Hollander, New York.—p. 254.

Congenital Hemolytic Anemia: Splenectomy in Case Simulating Cholecystitis. S. Eiss and G. L. Birnbaum, New York.—p. 359.

Clinical Study on Prevention of Peritonitis with Hexylresorcinol. S. F. Strauss, H. Sorter, A. A. Strauss and H. Necheles, Chicago.—p. 362.

Constipation: Its Management. L. L. Bower, Philadelphia.—p. 366.

Mode of Action of Bran: III. Bacterial Action on Bran. Nell Hirschberg and B. Fantus, Chicago.—p. 370.

Depression of Hydrochloric Acid Secretion in Allergic Conditions. C. A. Spivacke and M. Golob, New York.—p. 376.

Pancreatic Insufficiency with Food Allergy: Report of Case. M. Shushan, New Orleans.—p. 380.

Influence of Nutrition on Incidence of Gallstones and Cholecystitis. R. R. Ehrmann, New York.—p. 385.

Virginia Medical Monthly, Richmond

69:471-532 (Sept.) 1942

Treatment of Ocular Injuries. J. H. Dunnington, New York.—p. 473.

Effect of War on Mental Health of Civilian Population. J. B. Pettis, Portsmouth.—p. 475.

Development of Psychiatry and Neurology in Virginia. B. R. Tucker, Richmond.—p. 480.

Treatment of Acute Appendicitis with Peritonitis. H. C. Lee, Richmond.—p. 484.

Vitamins—Recognition of Avitaminosis in Clinical Practice. B. F. Sieve, Boston.—p. 487.

Diadermic Drinking of Water. L. I. Hallay, Fort Blackmore.—p. 496.

69:533-588 (Oct.) 1942

How We Have Treated Graves' Disease During a Quarter Century. J. H. Means, Boston.—p. 535.

Report of Epidemic of Acute Respiratory Infection with Pneumonitis. A. F. Robertson Jr., Staunton.—p. 542.

*Hormone Treatment of Prostatic Hypertrophy and Cancer: Review and Initial Clinical Experiences. L. D. Keyser, Roanoke.—p. 544.

Benign Bronchial Adenoma: Report of Peripheral Lesion of Right Middle Lobe, Cured by Partial Lobectomy. L. E. Mayo Jr., Portsmouth.—p. 550.

Present Day Status of Anesthesia. L. V. Hand, Boston.—p. 554.

Partial Gastrectomy for Chronic Ulcer. M. K. King, Norfolk.—p. 563.

Indications for Terminating Artificial Pneumothorax. C. P. Cake, Washington, D. C.—p. 566.

Stones in Female Urethra. W. L. Eastlack, South Boston.—p. 569.

Current Information on Syphilis. Committee on Syphilis Control Medical Society of Virginia.—p. 571.

Endocrine Treatment of Prostatic Hypertrophy and Cancer.—Keyser reports the results in the treatment of prostatic disease with endocrine preparations and synthetic substitutes. Of 22 patients, 14 had clinically benign hypertrophy varying in symptoms from increased frequency, diminished stream and little residual urine to more or less complete retention requiring frequent catheterization, and 8 had nonspecific prostatitis associated with pus and bacteria. Of the 7 (1 with carcinoma) with complete or almost complete retention the use of an indwelling catheter and the daily administration of 1 mg. of diethylstilbestrol by mouth and 1 mg. intramuscularly, 2 were able to empty their bladders freely, with little residual urine, with increased stream and with less nocturia in two weeks. Each of the 4 regarded as poor surgical risks was subjected to suprapubic cystostomy for drainage and then given diethylstilbestrol by mouth and intramuscularly. A few weeks later each reported that he had begun to void naturally. The suprapubic catheters were removed and the wounds healed. Of the 7 with benign hypertrophy with residual urine from zero to 3 to 4 ounces (90 to 120 cc.) but with nocturia and diminished stream 6 have had decided benefits and are emptying their bladders completely, with better stream and with less frequent nocturia. None of them at present are regarded as candidates for immediate resection. Some of the 8 with nonspecific prostatitis have had definite improvement and have been relieved of dysuria, backache and general lassitude. The infection for the most part has been reduced to a small residuum, as determined by microscopic study and cultures of the prostatic secretion, but a residuum does remain. The hazards of using diethylstilbestrol are nausea, dizziness, edema of the lower extremities and a cutaneous erythematous rash, leading at times to exfoliative dermatitis. Loss of libido and oligospermia result from large doses or prolonged treatment and are contraindicated for younger or vigorous mature men. Patients receiving large doses over a long period frequently have painful swollen breasts. There are hypothetic reasons for the use of testosterone, alternating with diethylstilbestrol, in attempting treatment of an endocrine imbalance. Surgery is still the method of choice for treating prostatic hypertrophy, yet in borderline cases and in certain urologic derelicts with such concomitant disease contraindicating surgical intervention endocrine therapy may be tried with or without suprapubic cystostomy. In nonoperable prostatic cancer the regimen will usually stay the progress of the disease to an extent at present indeterminate.

War Medicine, Chicago

2:683-900 (Sept.) 1942

Physiology of Labyrinth Reviewed in Relation to Seasickness and Other Forms of Motion Sickness. W. J. McNally and E. A. Stuart, Montreal, Canada.—p. 683.

Head Injuries in War, with Especial Reference to Gunshot Wounds, Including Report on Late Results in Some of Harvey Cushing's Cases of 1917. H. Cairns, Oxford, England.—p. 772.

Major Studies of Fatigue. R. R. Sayers, Washington, D. C.—p. 786.

Need for Physical Therapy Technicians. J. S. Coulter and H. A. Carter, Chicago.—p. 824.

Use of Tyrothricin in Treatment of Infections: Clinical Studies. C. H. Rammelkamp, Boston.—p. 830.

Prospectus of a Medical History of the War of 1941 to 19—. J. F. Fulton, New Haven, Conn.—p. 847.

West Virginia Medical Journal, Charleston

38:329-362 (Sept.) 1942

Pneumonia. W. V. Wilkerson, Prenter.—p. 329.

Forty Hour Week for Surgeons. R. J. Reed Jr., Wheeling.—p. 335.

Multiple Myeloma: Review of Literature and Report of Five Cases. R. C. Greenberg, Masontown, and H. L. Frosch, New York.—p. 340.

Pneumococcus Type XXXI Meningitis with Recovery: Case Report. K. L. van Horn and A. C. Woofter, Parkersburg.—p. 348.

Wisconsin Medical Journal, Madison

41:743-874 (Sept.) 1942

Serial Curves in Coronary Occlusion. J. B. Carter, Chicago.—p. 759.

Mental Deficiency as Problem in General Practice. A. L. Rautman, Chippewa Falls.—p. 771.

Constitutional Asthenia. C. W. Osgood, Wauwatosa.—p. 776.

41:875-966 (Oct.) 1942

A Charge to Keep. F. E. Butler, Menomonie.—p. 889.

Treatment of Peritonitis and Ileus. G. C. Penberthy and C. D. Benson, Detroit.—p. 893.

Treatment of Puerperal Infection. T. K. Brown, St. Louis.—p. 899.

Prevention of Rheumatic Heart Disease. R. H. Feldt, Milwaukee.—p. 906.

Treatment of Rheumatoid Arthritis with Gold Salts. J. J. Furlong, Milwaukee.—p. 910.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2:237-270 (Aug. 29) 1942

Classification of Nerve Injuries. H. J. Seddon.—p. 237.
*Carotenemia. S. Almond and R. F. L. Logan.—p. 239.
*Bee Stings in Kenya Colony. A. J. Jex-Blake.—p. 241.
Indirect Radiotherapy. W. Vignal.—p. 242.
*Treatment of Phosphorus Burns. A. T. Jones.—p. 244.
Relation of Pyogenic Skin Infections to Skin Carrier Rate. N. H. Martin.—p. 245.

2:271-300 (Sept. 5) 1942

Alphabet of Breast Feeding. C. McNeil.—p. 271.
Ulceromembranous Stomatitis: Three Atypical Cases. T. C. Henry.—p. 273.
Group Psychotherapy. M. Jones.—p. 276.
Sedimentation Rate and Sedimentation Index. B. L. Della Vida.—p. 278.
Preparation of House Dust Extracts. C. Sutherland.—p. 280.

Carotenemia.—Almond and Logan describe 4 cases of carotenemia in normal women after eating more than the threshold quantity of 4 pounds (1,814 Gm.) of raw carrots per week for a minimal period of seven months. The condition developed within two months in a baby fed only on the breast of its carotenemic mother. The simple three layer test of Greene and Blackford consists of equal quantities of serum, alcohol and petroleum ether shaken up in a tube. This may be left to settle as the volatile petroleum ether with its dissolved lipochromes rises to the top. If lipochromes are present in abnormal amount, this top layer will show a definite yellow tinge which is pathognomonic of carotenemia, but if the middle alcohol band is excessively yellow and is covered by a clear petroleum layer the diagnosis is jaundice.

Bee Stings in Kenya Colony.—The fierceness with which native Kenya bees attack is illustrated by 3 cases that Jex-Blake reports. The numbers of the stings removed varied from two to five hundred. The amount of venom injected by a single bee sting is said by Phisalix to be 0.33 mg. The first patient suffered no more than a severe but passing inconvenience from the stings. He must have had an exceptionally high tolerance of or immunity to bee stings. The second and third patients probably had the normal degree (if there is such a thing) of sensitiveness. They became unconscious, had severe diarrhea and vomited. Two fatal cases are reported which illustrate the fact that a man who has suffered no more than the normal transient local pain and swelling after bee stings all his life may suddenly become hypersensitive to bee venom. A healthy man of 45 was stung four or five times while driving a swarm of bees out of his veranda. These stings gave rise to the usual transient painful swellings. A fortnight later he was again stung on the face four or five times; in about two minutes he collapsed and died. Artificial respiration, continued for an hour, was without effect. It seems reasonable that this patient was sensitized or rendered hypersensitive to bee venom by the first four or five stings. But for the other patient there is nothing to show why he suddenly became hypersensitive to bee venom nine months before he died (during which each stinging would become worse) after having been quite insensitive to it for twenty years. The sensitization in the first case was specific; in the other 1 it may have been specific, but nonspecific sensitization to bee venom should not be overlooked. If the signs and symptoms following severe or fatal cases of bee stings are compared with those in severe or fatal cases of serum disease they are nearly identical, and death in either case can be properly set down to anaphylactic shock.

Treatment of Phosphorus Burns.—With his experience in treating 65 cases of burns caused by phosphorus, Jones advises the following procedure: The affected area should be immediately flooded with water, followed by a thorough wash with warm sodium bicarbonate solution (roughly 2 tablespoons to a pint [500 cc.] of water). Any obvious particles of phosphorus disclosed by examination in the dark should be picked off with forceps. The affected area should be swabbed with 1 per cent solution of copper sulfate and a further exploration made for phosphorus particles so revealed. The affected area should be soaked or immersed, if possible, in warm sodium bicarbonate solution for a prolonged period. The duration of this soaking depends on the size and depth of the burn—small burns half an hour, large burns one to two hours. The area should be dressed daily with acriflavine emulsion 1:1,000. Burns near the eyes are best treated by a mask of lint soaked in sodium bicarbonate solution renewed every four hours. As soon as healing begins (seven to ten days) boroseptic ointment provides a satisfactory dressing, and its use can be continued until the scar produced is sound. Tannic acid and other coagulants do not give satisfactory results. The disadvantage of acriflavine emulsion is that individual, local and generalized cutaneous eruptions may occur, but a daily inspection will detect them, when boroseptic ointment should be substituted. With this treatment results are obtained which are comparable to those of burns caused by caustic soda and sulfuric acid. Healing is slower and scars are thinner in burns caused by phosphorus.

Lancet, London

2:269-298 (Sept. 5) 1942

Certification of Death in Infancy. F. J. W. Miller.—p. 269.
*Value of Local Chemotherapy in Wounds and Burns. D. N. Matthews.—p. 271.
Maximal Response to Liver Therapy in Pernicious Anemia. B. L. Della Vida, note on dosage by S. C. Dyke.—p. 275.
Vitamin C Deficiency in "Irresponsive" Pernicious Anemia. S. C. Dyke, B. L. Della Vida and Elizabeth Delikat.—p. 278.
*Use of Ethyl Chloride Spray in Soft Tissue Injuries. C. A. McIntosh and J. G. Petrie.—p. 279.
*Freezing with Ethyl Chloride to Relieve Pain and Loss of Movement. A. K. Henry.—p. 280.
Staphylococcic Pneumonia: Recovery with Sulfathiazole; Case. J. Gordon.—p. 281.

Local Chemotherapy in Wounds and Burns.—Matthews evaluated the local application of the sulfonamides in the treatment of wounds and burns by determining the number of living organisms recoverable daily from a known quantity of exudate. Their number was decidedly lowered even when only a trace or at most 1 mg. per hundred cubic centimeters of the drug was present in the blood stream. The urine should be examined frequently for signs of renal damage and particularly when surfaces of more than average vascularity are being treated. Chemicals such as eusol and procaine hydrochloride anesthetics should not be used during local chemotherapy, as they antagonize the sulfonamides.

Ethyl Chloride Spray in Soft Tissue Injury.—While injuries to the bone and infections require rest, it appears that uncomplicated injuries to soft tissue are far better treated by early active movement. Ethyl chloride sprayed over the tender area of spasm or sprain will in most instances permit active movement without much discomfort. A full range of movement is carried out several times a day, though the part should not be subjected to excessive strain. McIntosh and Petrie have obtained excellent results with 109 not too extensive acute traumatic lesions of the soft tissues of the ankle, finger, thumb, wrist, elbow, acromioclavicular joint and minor injuries about the knee. If the spraying is delayed the period of disability will be prolonged. Chronic lesions may also improve. Late lesions of any of the foregoing conditions, tenosynovitis, pain of indefinite origin and the like have shown remarkable improvement. If there is no noticeable response, some other underlying condition may have been overlooked. Undoubtedly the method removes the local reflex pain, which diminishes the amount of muscle spasm and permits the muscle to function again. When this has been accomplished, sufficient lymphatic circulation is started to begin to remove the local traumatic edema. An increase in the edema may occur occasionally, particularly in sprained ankles. However, this is no indication to discontinue treatment. Ready cooperation of the patient is a great help. Soldiers may be returned to full duty in a minimum of time, while during their period of light duty they have relatively little incapacity. So far the only complication has been local irritation of the skin.

Freezing with Ethyl Chloride to Relieve Pain and Loss of Movement.—Henry reports isolated instances from the records of more than 100 patients of the relief of pain from cooling or freezing with ethyl chloride spray. Many painful conditions were completely cured. Some with low back pain who had not been able to move with comfort did so easily after the treatment. Others were glad of whatever relief they got and came repeatedly to get it.

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Revista Clínica Española, Madrid

6:81-160 (Jan. 30) 1942. Partial Index

*Deficiency Achylias and Diarrheas: Study of Madrid Patients During War. F. Jiménez Garcia and F. Grande Covián.—p. 92.
Prognostic Value of Determination of Absorption Coefficient in Jaundice. J. Surós Forns.—p. 96.
*Hereditary Chondrodysplasia Deformans (Dyschondroplasia) and Its Nosologic Position. C. Jiménez-Díaz, E. Roda and F. Clavel.—p. 99.
Ectopic Chorionepithelioma of Vagina with Simultaneous Vesicular Mole in Uterus: Case. M. Usandizaga and J. M. Mayor.—p. 107.
Role of Vegetative Nervous System in Cardiovascular Changes at High Altitude. J. A. Adrio Mateo.—p. 112.
*Appraisement of Vitamin C by Methylene Blue Method: Modification of Method of Martini and Bonsignore. H. Castro Mendoza and J. Sánchez Rodríguez.—p. 117.
Diagnosis of Cysticercosis of Brain. P. Gotor.—p. 121.

Deficiency Achylia and Diarrhea: Study of Madrid Patients During War.—Jiménez Garcia and Grande Covián cite reports from literature to indicate the frequent association of certain types of avitaminosis with disturbances of gastric secretion. The high incidence of deficiency diseases in Madrid during the Spanish war directed the authors' attention to the gastric function in deficiency disease. They studied the gastric chemistry of 495 patients with deficiency diseases. Few of the patients complained of gastric discomfort. The majority with hunger edema, optic neuritis and a paresthetic causalgic syndrome said nothing regarding the gastric function on being questioned. Those with pellagra and glossitis frequently had mild digestive disturbances. Secretory changes detected by examination of the gastric contents varied from hypochlorhydria to achylia. They must be ascribed to the deficient diet of the population of Madrid. These secretory gastric disturbances are the result of a deficiency in the vitamin B_1 complex. Therapeutic observations seem to indicate that nicotinic acid and vitamin A, as well as B, are incapable of restoring the normal gastric secretion of these patients. The Madrid patients with deficiency diseases frequently had severe diarrheas, but these could be combated with nicotinic acid in 94 per cent of the cases.

Hereditary Chondrodysplasia Deformans.—Jiménez-Díaz and his associates report 5 cases of deforming chondrodysplasia. Two of these were observed in 2 brothers, and in these hereditary transmission from the father's side of the family could be proved. These patients presented exostoses. In the other 3, exostoses and chondromatosis were combined. It could be clearly seen in 1 case that the osteochondromatosis was secondarily superimposed on exostosis. The authors discuss the nosologic position of Ollier's disease (achondroplasia), of multiple osteochondromatosis and of exostosis disease and reach the conclusion that these disorders are different forms of the same process, which is the result of a dysplasia of the metaphysial cartilage.

Measurement of Vitamin C by Methylene Blue Method.—Castro Mendoza and Sánchez Rodríguez present a critical review of the different methods for the determination of vitamin C in blood and urine and describe a modification of the methylene blue method of Martini and Bonsignore. It consists in performing colorimetry before and after irradiation of the solution and obtaining the difference in the two readings in the calibration curve. This method has been employed since 1939, first with the aid of the colorimeter of Dubosc, then with the photometer of Pulfrich and finally with the photoelectric colorimeter of Leitz. The authors give a detailed description of the material, the required reagents, the technic and the mode of computation. They reach the conclusion that the method is the most specific for the clinical detection of vitamin C.

Semana Médica, Buenos Aires

69:1133-1192 (June 4) 1942. Partial Index

Early, Secondary and Late Syndrome in Diphtheria. F. F. Inda, I. Natin and Cornelia Da Rin.—p. 1144.
*Cardiac Neurosis of Endocrine Origin. E. F. Diaz Mindurry.—p. 1159.

Cardiac Neurosis of Endocrine Origin.—Díaz Mindurry finds that the most frequent symptoms complicating a neurosis of anxiety or depression are those of heart disease. There may be attacks of palpitation, transient anginal pain and a feeling of insufficiency of the heart. These symptoms find no counterpart in physical signs. Clinical examination reveals transient or permanent tachycardia and extrasystoles. The teleroentgenograms and electrocardiograms are normal. Hyperthyroidism, corticoadrenal insufficiency and gonadal hormone insufficiency, alone or in combination, are the most frequent predisposing factors. Hyperthyroidism is mild and is of the abortive or oligosymptomatic type. The patients are hyperemotional and hypersensitive. They lose weight and get easily fatigued. They complain of dizziness, insomnia, nervous instability and vasomotor and other disturbances which indicate an imbalance of the basal metabolism and hyperthyroidism. As a rule the thyroid is not palpable. Arterial pressure is slightly increased. Moderate corticoadrenal insufficiency, alone or in combination with hyperthyroidism, is frequent in young patients of asthenic type with a tendency to lose weight and to be easily fatigued. The patients are depressed and hypochondriac. The arterial blood pressure is normal or low. Gonadal hormone insufficiency is frequent. Sometimes it is related to sexual life. Masturbation, sexual abstinence and, especially, coitus interruptus are causes of gonadal hormone insufficiency as a predisposing factor of cardiac neurosis. In women, especially during and after the menopause, it is frequently associated with hyperthyroidism and hypertension. Glycemia tests and the quantitative determinations of ascorbic acid and blood cholesterol are of value in the diagnosis of corticoadrenal insufficiency. In the treatment it is necessary to break the vicious circle of symptoms and alter the mental attitude of the patient. Cardiac tonics, bromides and barbital preparations are contraindicated. Exhibition of proper glandular preparations is indicated. Coffee, tea, maté tea and smoking are interdicted. Abdominal visceroptosis is to be corrected and meteorism and intestinal parasitism controlled. Sometimes it is necessary to remove the patient temporarily from the family or from work. Testosterone propionate and roentgen irradiation of the hypophysis are indicated in hyperthyroidism due to hypophysial hyperfunction. Diiodothyroxin, ergotamine, yohimbine and small doses of quinine or of quinidine have their indications in therapy of thyroid hyperfunction. A daily injection of 10 or 20 units of insulin, followed by administration of some dextrose in the course of diiodothyroxin therapy is indicated for lean patients with hyperthyroidism and without corticoadrenal insufficiency. Adrenal cortex extract in doses of 2 mg. twice a week, alone or in combination with a daily dose of 0.1 or 0.2 Gm. of ascorbic acid by mouth, or of a parenteral injection of cholesterol solution, is indicated in cases of corticoadrenal insufficiency. Estrogens are indicated in ovarian and hypophysial insufficiency, especially during the menopause. Estrogens are contraindicated in premenopausal metrorrhagias. They are indicated in small doses (from 500 to 2,000 units a day) and in combination with ovarian extracts in cases of ovarian insufficiency of young women. The results of ovarian hormone therapy are good if the treatment is persisted in for a sufficiently long period.

69:1253-1312 (June 18) 1942. Partial Index

Care of Children Intubated or Tracheotomized for Diphtheritic Croup. Florencio Bazán.—p. 1260.
*Semilunar Splanchnic Anesthetic Block in Therapy of Arterial Hypertension. A. R. Albanese, R. Vedoya and J. González Videla.—p. 1266.

Semilunar Splanchnic Block in Arterial Hypertension.—Albanese and his collaborators describe a technic of semilunar splanchnic infiltration which they practiced in 50 cases of hypertension. From 10 to 20 cc. of a 1 per cent solution of procaine hydrochloride without epinephrine is injected with a needle 10 cm. long. The infiltration is done on the left side. If the results are incomplete the right semilunar splanchnic is infiltrated. The treatment is repeated at intervals of from fifteen to sixty days. It is done on the side on which the anesthetic results were more evident. Infiltration may be performed on both sides. Results of semilunar splanchnic anesthetic block are of the same order as those of operative intervention. The subjective symptoms disappear for from fifteen to sixty days. The blood pressure falls moderately after the treatment. When it increases again the figures are lower than those observed before the treatment. The treatment is indicated for all clinical types of hypertension, even for the severe types and for the elder patients. Results of repeated injections are better than those of a single treatment.

Chirurg, Berlin

13:129-160 (March 1) 1941. **Partial Index**

*Clinical Examinations in Peripheral Vascular Disturbances. D. Phillippedes.—p. 129.
Spinal Anesthesia During Childhood. Vara-Lopez.—p. 141.
Pulmonary Complications Following Abdominal Operations. C. Prima.—p. 144.
Significance of Vitamin K for Surgery. H. W. Voigt.—p. 146.

Peripheral Vascular Disturbances.—Diagnosis of vascular disorders of extremities may be difficult in the incipient stage, says Phillippedes. The symptoms may be mistaken for those of varicose veins, flatfoot or rheumatism until the appearance of gangrene discloses the nature of the disturbance. It is important not only to detect the circulatory disturbance but to establish its organic or functional nature and the degree and location of the alterations. Methods of examination at the Kirschner clinic in Heidelberg consist of oscillometry based on the measurement of the pulse amplitude under various pressures exerted by the cuff of the hemodynamometer, the "scala alternans" of von Recklinghausen being utilized. The values obtained by oscillometry are plotted in curves. Oscillometry is particularly valuable in incipient arterial disorders in which there are no visible circulatory signs. It is likewise useful in wounds of the extremities in which a vascular injury is suspected but in which the pulse cannot be felt because of a hematoma and edema. In traumatic aneurysms oscillometry permits of evaluation of the persisting blood perfusion of the extremity. When the oscillometric curve is pathologic, arteriography should be performed before operative intervention. Only the visualization of vessels can provide exact information regarding the severity and localization of the obliteration, the anastomoses and the collateral circulation. It is important to differentiate a spastic vascular disorder from an organic one, to recognize a combination of the two and to determine whether the spasm can be modified by exclusion of the sympathetic. The determination of the cutaneous temperature under various conditions is a more sensitive method for the detection of a spastic condition than is oscillometry. There exist various methods by which the spasm can be abolished by temporary exclusion of the effect of the vasomotor fibers. These constitute the hot box test, infiltration of the stellate ganglion and paravertebral anesthesia. These methods should be employed in all circulatory disturbances of the extremities; they not only are of diagnostic and prognostic importance but also provide information regarding the proper time and the method of treatment.

Zeitschrift für klinische Medizin, Berlin

139:1-126 (Feb. 14) 1941. **Partial Index**

Electrocardiographic Study in Anemias and Blood Diseases Accompanied by Anemia. G. W. Parade and H. Franke.—p. 1.
Histamine Content of Human Milk. B. Rex-Kiss and F. Went.—p. 26.
Transport Function of Extravascular Plasma Proteins. F. Went and B. Rex-Kiss.—p. 29.
*Cytologic Diagnosis of Carcinomatous Pleural and Peritoneal Effusions by All Culture. H. Hengstmann.—p. 58.
*Effect of Thymus Hormone on Blood Sugar. C. Bomskov and K. Stein.—p. 96.
*Modification of Carbohydrate Tolerance by Thymus Hormone. C. Bomskov and E. Schweiger.—p. 102.
*Thymus Hormone and Basal Metabolism: Role of Thymus Hormone in Carbohydrate Metabolism. C. Bomskov and W. Bausch.—p. 121.

Cell Cultures of Carcinomatous Pleural and Peritoneal Effusions.—Hengstmann directs attention to the difficulties in the differential diagnosis of carcinomatous pleural and peritoneal effusions. Earlier investigations indicate that the individual tumor cell does not possess objective and constant characteristics which permit of its recognition. Agreement exists only with regard to recognition of tumor cells when present in groups. The occurrence of such conglomerates is not frequent. Bürger, of the author's clinic in Leipzig, suggested that effusions be examined by the tissue culture method. The author describes the morphologic and functional characteristics of carcinoma cells in vitro. The morphologic characteristics of the carcinoma cell are clearer in the cell culture than in the smear. The culture also reveals the vital manifestations of the cells and their reaction to the surrounding medium, particularly to the supporting tissue and to the plasma coagulum serving as a nutrient medium and the behavior of cells to one another. The various functional conditions of the fibrocytic cells are clearly differentiable from the carcinoma cells. The author examined 85 effusions of various origins. In 20 a malignant neoplasm was recognized as the cause, and in 13 carcinomatous invasion had occurred into the thoracic and abdominal serous cavities. In 5 a carcinomatous pleurisy had developed and in 8 a carcinomatous peritonitis; in 3 cases no carcinomatous dissemination was demonstrable and in the 4 remaining the question of metastatization could not be ascertained. The cell culture is convincing only when positive. A tumor cannot be excluded with certainty in the presence of a negative culture.

Effect of Thymus Hormone on Blood Sugar.—Bomskov and Stein point out that the diabetogenic hormone of the anterior lobe of the hypophysis fails to produce effects if the thymus of the experimental animal has been destroyed. The diabetogenic hormone is the thymotropic hormone. It has a stimulating effect on the thymus similar to that of the gonadotropic hormone on the gonads. Bomskov and his collaborators discovered and isolated the thymus hormone. The authors found that the injection of thymus hormone as well as the injection of thymotropic hormone elevates the blood sugar content of rats and guinea pigs. There exist great individual differences, and some animals showed no reaction. Nevertheless, the tests indicate that the thymus hormone exerts the same effect on blood sugar as the pituitary diabetogenic hormone. With either hormone the blood sugar reaction differs individually. The hyperglycemia may be missing or only slight in spite of the existing glycosuria and of a great decrease in the glycogen content of the liver. Conditions designated as paradiabetes and hypophysial diabetes have long been differentiated from the purely pancreatic diabetes. These atypical forms of diabetes are greatly or entirely resistant to insulin. In some of these cases an almost normal blood sugar content may be accompanied by considerable glycosuria. It is possible that increased action of the thymus hormone plays a part in these cases. Diabetes of childhood, hitherto generally regarded as a hypophysial type, is believed by the authors to be a thymogenic type in view of the fact that the thymus hormone is especially active during the period of life characterized by increased growth. Acromegaly is associated with diabetes in about 40 per cent of the cases. Studies on the thymus involvement in acromegaly disclosed (1) hyperfunction of the thymus, demonstrated by the elimination of the thymus hormone in the urine, (2) impairment of the carbohydrate metabolism, manifested in a reduced sugar tolerance, and (3) lymphocytosis of the blood.

Thymus Hormone and Carbohydrate Tolerance.—On the basis of clinical observations which indicated that hyperfunction of the thymus is accompanied by an abnormal dextrose tolerance, Bomskov and Schweiger made animal experiments to demonstrate that, although the hyperglycemia induced by the thymus hormone is slight and fluctuating, the disturbance in the carbohydrate content can be demonstrated by tolerance tests. The injection of large doses of thymus hormone into dogs produced a great increase in alimentary hyperglycemia. The level of the dextrose tolerance curve was from two to three times as high as the normal curve. Not only was the level of the curve changed, but also the duration of the elimination of the dextrose from the blood was greatly prolonged compared to normal animals. The fact that treatment with thymus hormone is capable of inducing changes in the dextrose tolerance is another proof that the thymus hormone plays a part in carbohydrate metabolism. The experiments also corroborate clinical observations that increased elimination of the thymus hormone in the urine of adults is accompanied by a change in dextrose tolerance. The tests confirmed earlier observations that in dogs administration of thymus hormone leads to leukocytosis and lymphocytosis.

Thymus Hormone and Basal Metabolism.—Bomskov and Bausch demonstrate that, in spite of the fact that the thyroid and thymus have the same effect on the glycogen of the liver, the mechanism of action differs considerably. The thymus hormone exerts no influence on the basal metabolism of normal animals. The thyrogenic sugar mobilization is for the purpose of increased energy production, whereas the thymogenic sugar mobilization is for the purpose of increased deposits or growth. It is necessary to differentiate between a thyrogenic and a thymogenic metabolic status; that is, there is a difference between growth metabolism and oxidation metabolism.

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Book Notices

Shock: Its Dynamics, Occurrence and Management. By Virgil H. Moon, A.B., M.Sc., M.D., Professor of Pathology, Jefferson Medical College, Philadelphia. Cloth. Price, $4.50. Pp. 324, with 36 illustrations. Philadelphia: Lea & Febiger, 1942.

The wealth of clinical observations on shock during the first world war and the prodigious amount of research which followed has helped to clarify many debatable points, without however definitely establishing the essential cause of the syndrome. Moon reviews the various theories regarding the production of shock and presents some original concepts based on his experimental work and pathologic studies. In his discussion of the dynamics of shock Moon emphasizes two factors: damage to the endothelium of the capillaries (capillary atony) and anoxia. Hemoconcentration occurs early and tends to progress in a degree corresponding to the degree of shock. Hemoconcentration indicates abnormal permeability of endothelium and the consequent disturbance of fluid balance. Moon defines shock as "a disturbance of fluid balance, resulting in a peripheral circulatory deficiency which is manifested by a decreased volume of blood, reduced volume flow, hemoconcentration and by renal functional deficiency." The disturbance of fluid balance may originate from diverse causes, but each of them affects primarily or secondarily the permeability of the endothelium; thus the dynamics of shock may be summed up as endothelial damage plus anoxia. The concept that a pronounced fall in arterial pressure was the central and most important feature in the syndrome has not been borne out by clinical experience. Shock in its early stages may exist in the presence of normal or even elevated arterial pressure. The acapnia theory and the decreased alkali reserve theory likewise could not be supported in a number of instances, while postmortem studies frequently failed to find fat emboli. The cause of shock in traumatic cases, according to Moon, is to be seen in the absorption of the products from injured tissues. In the experience of the first world war this deficiency often was found to be out of all proportion to the apparent severity of the wound and subsided in a remarkable fashion after the amputation of a mangled limb or the débridement of other wounds.

The Special Committee on Shock and the Allied Conditions of the first world war concluded that shock in the wounded resulted from a combination of causes, including exhaustion, exposure, pain, anxiety, hemorrhage and infection, and that the absorption of products of tissue autolysis from the area of injury was the most important of these factors. The theory of traumatic toxemia finds support in the experiments of Bayliss and Cannon, who produced shock in cats by mechanical trauma to the muscles of the thigh. The previous severance of the lumbar cord did not prevent shock following trauma to the thigh muscles. This would contradict Crile's theory of vasomotor exhaustion. Evidently the fall in blood pressure was not due to painful stimulation acting on the central nervous system or to any mechanism dependent on nerve communications to the wounded area. Shock did not occur if all the vessels of the legs were ligated but occurred promptly following the release of such ligatures. Examination of the lungs for fat failed to show any evidence of fat emboli.

More recently the validity of the hypothesis of traumatic toxemia came to be questioned as the result of the experiments of Blalock, of Phemister and of their associates. They failed to demonstrate the presence of any toxic substance originating in the areas of injury and attributed the circulatory failure to local hemorrhage and not to traumatic toxemia. Cross circulation experiments were advanced as final evidence invalidating the supposition that absorption of toxic substances is a causative factor in shock resulting from trauma. Moon, however, points out that much of the confusion concerning the dynamics of shock originates chiefly from four major sources. The first of these was inadequate knowledge of endothelial function and reactions and circulatory disturbance originating in the capillaries. Many surgeons regarded traumatic shock as a distinct entity and did not comprehend its relationship to circulatory failure of exactly the same type originating under other conditions. The second major cause for confusion was the failure to distinguish between shock and the effects of hemorrhage; third, variations in blood pressure used as a criterion, and, fourth, failure on the part of the experimenters to take into account in their animal experiments the depressor effects of anesthesia and the loss of blood. Experimental technic introduced by the author in which the effects of anesthesia and hemorrhage are eliminated has demonstrated that the absorption of products derived from damaged tissues, independent of narcosis and of hemorrhage, will produce the complete syndrome of shock. The author's particular contribution to the subject consists in pathologic studies of shock. He points out that hemoconcentration during life and the presence of engorged capillaries, stasis, petechiae and edema after death indicate that endothelial damage is a dynamic factor of the highest importance. He had established that shock, like other conditions of disease, is accompanied by a pattern of morphologic changes which are related etiologically to its mechanics of origin and which indicate that this function of endothelium is a major factor in its development.

Part II of the book is devoted to the discussion of the prevention, recognition and management of shock. Here the author is essentially in agreement with the accepted practice. An emphasis, however, is placed on differentiation of shock from hemorrhage by means of studies of hemoconcentration. The author again and again stresses the fact that observations on hemoconcentration are most useful in indicating the incipient stage of shock. Physicians, interns and technicians are capable of making hemoglobin readings or counts of erythrocytes; many institutions have facilities for making determinations of specific gravity and of cell volume by hematocrit. The presence of hemoconcentration or hemodilution may be shown quickly and with sufficient accuracy by either of these methods.

This timely book presents in a small volume critical and more or less impartial analysis of the concepts regarding the shock syndrome. The author's literary style is distinguished by compactness and lucidity.

Annual Review of Physiology. James Murray Luck, Editor. Victor E. Hall, Associate Editor. Volume IV. Published by the American Physiological Society and Annual Reviews, Inc. Cloth. Price, $5. Pp. 709. Stanford University P. O.: Annual Reviews, Inc., 1942.

This is the fourth of a series the individual volumes of which are companion pieces to the Annual Review of Biochemistry. These books have become essential as reference works to those engaged in investigation and teaching in the biologic and medical sciences. In the present volume twenty-three topics are considered: permeability; the physiologic effects of neutron rays; physiologic aspects of genetics; developmental physiology; water metabolism; growth; energy metabolism; the physiology of the skin; the peripheral circulation; heart; blood; the digestive system; kidney; electrophysiology; the spinal cord and reflex action; the central nervous system; the autonomic nervous system; sense organs; metabolic functions of the endocrine glands; the physiology of reproduction; physiologic psychology; applied physiology, and the pharmacology of drug addiction. Most of these have been included in previous issues, but two are new: the review of the literature on water metabolism and the review of the pharmacology of drug addiction. Sections on respiration, the lymphatic system, temperature regulation, muscle, and liver and bile, which were included in previous volumes, have been omitted. It is assumed that they will be again incorporated in future editions. The space allotted to pharmacology has been cut to one article in contrast to the two or three formerly seen. An author and a subject index are available.

An immense amount of investigative work is covered by each volume of the two annual reviews, and, while there is necessarily considerable overlapping, these books are too voluminous to be read in detail by the average interested person. As they stand, only specific sections are of value to most individuals. The present style makes extended reading of these books difficult, thus destroying one of the prime objects of the work, that of keeping the reader up to date over a wide range of subjects. The annual reviews would become more than mere reference lists if each reviewer was encouraged to state his own interpretations of the work covered and to gather the results listed into a unified picture (even though that picture

would be a purely personal one) in a summary of sufficient length to be of significant value. This is especially necessary since in most cases the review of any single publication is too brief to give the reader the information necessary to judge accurately the worth of the data reported. The reviewers of three of the subjects covered in the present volume have made a start in this direction; the sections on the central nervous system, physiologic psychology and the pharmacology of drug addiction present brief summaries.

In its present form the book is invaluable to workers interested in special fields; it is of little value to the busy reader attempting to keep himself up to date in the many aspects of physiology.

The Discovery of the Orgone. Volume I: The Function of the Orgasm. Sex-Economic Problems of Biological Energy. By Wilhelm Reich. Translated from the German Manuscript by Theodore P. Wolfe. Cloth. Price, $3. Pp. 368, with 18 illustrations. New York: Orgone Institute Press, 1942.

This book is intended primarily for psychoanalytically oriented students of human behavior problems. In the beginning the author says "the freudian 'unconscious' is actually tangible in the form of vegetative impulses and bodily sensations . . . a psychic experience may produce a lasting alteration in an organ." Freud's theory of the etiology of the neurosis is not complete . . . every individual who has managed to preserve a bit of naturalness knows that there is only one thing wrong with neurotic patients: the lack of full and repeated sexual satisfaction. . . . The severity of any kind of psychic disturbance is in direct relation to the disturbance of genitality. The prognosis depends directly on the possibility of establishing the capacity for full genital satisfaction." Probably few if any psychoanalysts will completely disagree with these formulations.

His work suffers from too much and often quite irrelevant rehashing of the author's own personal problems, particularly those involving his disappointment with his teacher, Freud. Despite these irrelevancies the book offers material for serious thought and careful investigation with clinical material by those engaged in treating patients with psychologic problems whether these problems are of an obviously emotional nature or are hidden under the symptoms of so-called organ neurosis. Reich has contributed greatly to the understanding of human behavior problems and to the technics of therapy; therefore it is probably wise to put to one side the political aspects presented in this work and to give thoughtful attention to the main thesis.

The book contains a comprehensive table of significant events leading to the present work arranged chronologically from 1861 to 1941 by the translator, Theodore P. Wolfe, whose translation, preface and annotations are all exceedingly well done. There is an appended glossary which may aid the uninformed reader in understanding Reich's terminology, which at times becomes difficult to follow. It is unfortunate that the author chose to disregard the constructive scientific contributions to research in the study of psychophysiologic problems made by Alexander, Simmell, French, Karl and William Menninger, Felix Deutsch, Fenechal, Dunbar, Wilson, Daniels, Saul and Benedek, among others. Reich seems to forget that he is not alone in contributing to scientific psychologic research. Could it be that he is so obsessed with his own theories and his own contributions that he does not "familiarize" himself with the recent and current literature or that he just ignores the contributions of others?

How Technical and Commercial Dictionary. Compiled by Antonio Perol Guerrero, industrial engineer, Escuela central de Ingenieros, Madrid. Part I: Spanish-English. Part II: English-Spanish. Part III: Conversion Tables of Weights, Measures and Monetary Units. Fabrikold. Price, $10. Pp. 600. Brooklyn: Editorial técnica unida, 1942.

In the preface the author points out that the introduction of new products, machinery and equipment into Pan American countries has exerted a tremendous influence on the Spanish language. Because there were no corresponding Spanish words, English words have been adopted bodily for most technical terms. This dictionary selects fifty thousand words commonly used in technical and commercial activities. It fails wholly as a helpful work in the field of medicine, since that field was obviously so special that medical words had to be largely eliminated. One searches in vain for such terms as allergy, immunology, viruses and many similar terms more recently in medical usage. After all, with the speed of advancement of modern science, even fifty thousand words are a relatively small selection.

Clinical Cardiology with Special Reference to Bedside Diagnosis. By William Dressler, M.D., Attending Cardiologist, Israel Zion Hospital, Brooklyn. Cloth. Price, $7.50. Pp. 692, with 169 illustrations. New York & London: Paul B. Hoeber, Inc., 1942.

Whoever opens this new book on clinical cardiology with some hesitation, because he feels that there is an abundance of excellent modern textbooks on the subject without apparent need for an additional one, will soon recognize that many chapters represent a new approach yielding new information and thus fully justifying another volume on clinical cardiology. Throughout the work the authority of an experienced clinician and keen observer who is familiar with the most recent progress in the entire field of cardiology can be felt. He has made valuable contributions. Dressler places the predominant weight on the recognition and correct interpretation of signs at the bedside. Instead of replacing the simple methods of inspection, palpation, percussion and auscultation gained by more accurate laboratory methods, he shows convincingly how the information gained by methods such as pulse recordings, electrocardiography and fluoroscopy, when applied at the bedside, can be used to improve and to simplify our methods of physical examination. This is best illustrated by the chapters on pulsatory phenomena of the chest wall and pulsations of the veins. The diagnostic gain of such an approach is made clear in the chapters dealing with lesions of the tricuspid valve. The book is divided in three main parts, on methods of examination, general pathology and special pathology, with a thorough and clear discussion of all common and less common conditions. To this some other chapters are added, including one on pregnancy and heart disease and one on surgery and heart disease. The number of pages might have been reduced by omitting frequent repetitions, but by such a procedure the individual chapters would have lost their completeness. Relatively little space is given to electrocardiography; however, all references made to the information obtainable by this method show the expert in this particular field. Dressler's book is a valuable addition to the available excellent textbooks on cardiology. It can be highly recommended to the student who is particularly interested in bedside diagnosis of heart disease; it will be read with benefit by the experienced cardiologist.

Macular Proliferation (Pseudotumour) and Closely Related Pictures of Disease (Retinitis Circinata, Coats' Disease, Etc.). By Stig Holm, M.D. Acta ophthalmologica, supplementum XIX. Paper. Pp. 90, with 13 illustrations. Copenhagen: Ejnar Munksgaard, 1941.

Many years ago the ophthalmologists of the Scandinavian countries, under the leadership of the late Prof. K. K. Lundsgaard, founded the *Acta ophthalmologica*, a journal for the purpose of making their publications available in the more frequently used languages of the world. Each article is published in German, French or English, according to the linguistic ability of the author. Once or twice a year a supplement of seventy-five to one hundred pages is issued free to regular subscribers. This contains a single research or compilation article that is too long for the regular issues but is sufficiently valuable to justify publication. The *British Journal of Ophthalmology* has followed this example and now the *Transactions of the American Academy of Ophthalmology and Oto-Laryngology* is planning to do likewise. On the whole, these supplements are extremely valuable. This supplement, based on the report of a case studied in the eye clinic and the histologic institute of the University of Lund in Sweden, contains an excellent description of the case, well illustrated in black and white, and a critically analytic study of the resemblance of this to similar retinal pictures, variously described and labeled with the names of different men. The textual material of the brochure is of interest only to ophthalmologists, but the character of the journal and the type of supplements are of interest to all who are interested in the literature of medicine.

Síndromes clínicos-radiológicos de retracción pulmonar. Por el Dr. Ángel I. Brisco Capurro. Tesis del doctorado, Universidad nacional de Buenos Aires, Facultad de ciencias médicas. Paper. Pp. 37, with 25 illustrations. Buenos Aires, 1939.

This is an interesting pamphlet including twenty-five excellent reproductions of roentgenograms illustrating graphically the various phenomena of unilateral pulmonary contraction, total and partial. Of especial interest are the ingenious diagrams illustrating the direction in which the contractions or retractions occur in the different lobes of the lung. This seems to follow certain lines except when deterred by limiting adhesions.

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Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

KENNY TREATMENT AND CONVALESCENT SERUM FOR POLIOMYELITIS

To the Editor:—Will you please give me the number of successful cases of poliomyelitis treated by the Kenny method? Also the number of failures? Is there any advantage in using the convalescent serum? How long should the Kenny treatment be kept up? John A. Colhoun, M.D., Roberts, Ill.

ANSWER.—Complete figures are not available as to the number of patients treated successfully or otherwise with the Kenny method. This method was not made available to the medical profession in general until 1942. During this year most of the 3,200 cases reported to date have been treated by the Kenny method or some modification. About five hundred physicians, nurses and physical therapy technicians have been taught the Kenny method. These represent every state in the union. It is their opinion that the Kenny method is superior to immobilization. Figures are not available as to "failures."

The Kenny method is not a cure but is symptomatic treatment using heat to overcome "spasm" and pain and early muscle reeducation to overcome "alienation" (apparent paralysis) and "incoordination" (substitution of well muscles for those affected by the disease). Treatment is continued for as long as the symptoms persist. Moist heat is applied for several weeks to several months. The muscle reeducation program may have to be continued for a year or more

The percentage of true paralysis will depend on the nature of the outbreak and individual factors rather than on the treatment applied, since no form of treatment can be expected to restore function when there has been massive destruction of anterior horn cells. These cases usually make up 5 to 20 per cent of all reported. The other 80 to 95 per cent make a better recovery under the Kenny method than under one of rigid immobilization.

Convalescent serum apparently has not been of any proved value either in clinical practice or in the experimental disease in laboratory animals. While it is used in many localities and is still widely advocated, its proponents usually defend their action on the basis that "it does no harm." Mice, cotton rats and monkeys infected with poliomyelitis virus had neither the death rate, the incidence of paralysis nor the incubation period altered by use of massive doses of convalescent serum.

CARBON DIOXIDE COMBINING POWER OF PLASMA

To the Editor:—In the laboratory of our hospital we had occasion to determine the carbon dioxide combining power of a plasma that had stood in the ice box for about eighteen hours before being examined. Slight hemolysis had occurred and the reading was four volumes per cent. The question arose: Does the plasma alter sufficiently on standing and with slight hemolysis to lower or alter appreciably in any way the result obtained? I am aware of the necessity of protecting blood under a film of oil to determine the carbon dioxide capacity of the blood, but that is not what I mean; I am interested in the carbon dioxide combining power. An opinion and references will be appreciated.

Charles Ablor, M.D., New York.

ANSWER.—This question was answered by Van Slyke and Cullen in their original paper (*J. Biol. Chem.* **30**:309, 1917) and has been substantiated by the practical experience of many others. Van Slyke and Cullen state that "plasma can be kept for a long time without alteration in its carbon dioxide binding capacity. . . . Sterile plasma, if kept cold in tubes that have been paraffined in order to avoid solution of alkali from the glass, can be preserved for over a week without alteration in its carbon dioxide capacity. . . . Plasma in ordinary glass can be kept for only a few hours, as sufficient alkali dissolves from the glass in longer intervals to increase measurably the carbon dioxide capacity." Slight hemolysis should not have more than a slight influence on the carbon dioxide combining power. Plasma should not give a significantly lowered carbon dioxide combining power after refrigeration for eighteen hours if it has been properly reequilibrated with alveolar air. Any change would be likely to be a slight elevation, owing to absorption of alkali from the glass.

RAMPANT DENTAL CARIES

To the Editor:—In a boy aged 4 premature decay of all teeth has taken place since the age of 2. This occurred in definite groups, first the upper front, then the rear and finally all the lower front teeth. All have been removed except a few which will soon have to undergo the same thing. The mother is quite concerned lest the same fate overtake the permanent teeth when they appear. Can you furnish any information on this?

M.D., Minnesota.

ANSWER.—Rampant dental caries such as that described is one of the unsolved and perplexing medicodental problems. Ordinary caries can be adequately controlled by early and consistent dental care and oral hygiene. However, rampant caries spreads so rapidly that the dental care and oral hygiene must be unusally meticulous, although this does not guarantee control of caries.

The literature does not contain an adequate solution to this problem, though it indicates that systemic factors affecting the character of the saliva may be responsible, although no definite proof has ever been established. Rampant caries as well as altered salivary composition may be present in hypothyroidism and mongolism but also in normal children. There is some indication that there may be a relationship between thiamine deficiency and rampant caries.

Early and consistent dental attention to remove the decay as soon as it appears will tend to decrease the rate of its spread. Careful oral hygiene will help. The physician should reduce the carbohydrate intake and insist that no candies be eaten. Salivary analysis may reveal some clue and should be supplemented by complete blood chemistry and urine analysis. The problem is basically a medical one but the clues are scanty.

ANEMIA AND CRAVING FOR ICE

To the Editor:—What would be the effect on the blood making organs of the ingestion of large amounts of ice? A widow aged 43, the proprietress of an ice cream parlor, eats 10 cents worth of chopped ice (10 pounds) daily. She has developed a craving for ice. When her own store is closed she will often visit another soda fountain, order soda, leave the soda and eat the ice. The patient's history reveals no serious illnesses, accidents or operations. She had an attack of syncope a month ago and at present complains of weakness, palpitation, shortness of breath, backache, constipation and poor appetite, all of one month's duration. Her blood pressure is 100 systolic, 60 diastolic; the hemoglobin is 4.3 Gm. per hundred cubic centimeters or 21.8 per cent, the color index 0.5, the erythrocyte count 2,660,000, the leukocyte count 4,750 with 71 per cent polymorphonuclear leukocytes, 2 per cent eosinophils and 27 per cent small lymphocytes. There is slight abnormality in size and shape. There is vacuolation of the cells, and the nuclear index is 10.8 with a slight shift to the left. The Wassermann reaction is negative. The urine contains only a few white blood cells. The physical examination is otherwise negative. Do you think that the ingestion of ice is the cause of the severe secondary anemia and other symptoms?

M. H. Axilrod, M.D., Atlantic City, N. J.

ANSWER.—There appears to be no reference in current books on psychiatry to a pathologic appetite for ice. It seems rather unlikely that the ice per se would cause any appreciable anemia.

Most of the patient's symptoms could result from the severe anemia. It is apparently a microcytic hypochromic type of anemia, which occurs in iron deficient states. Achlorhydria is frequently a conditioning factor in his type of anemia. Either an iron deficiency could have been carried over from before the menopause or there might have been more recent blood loss. Stool examinations and gastrointestinal x-ray examination are indicated.

As decreased temperatures in the stomach have been shown to reduce gastric acidity (*Surg., Gynec. & Obst.* **71**:172 [Aug.] 1940), one wonders whether prolonged ingestion of ice might have caused an achlorhydria in this case. Also has there been a general dietary restriction as a result of the abnormal appetite? The ice may conceivably be a secondary factor in the production of the anemia.

EPINEPHRINE AND AMINOPHYLLINE FOR ASTHMA

To the Editor:—What is the difference in indications for epinephrine and aminophylline in acute bronchial asthma? What is the intravenous dose of the latter? Eugene Talmage, M.D., Santa Monica, Calif.

ANSWER.—Aminophylline is used for the relief of the attacks of asthma usually only when the patient fails to respond to subcutaneous injections of epinephrine solution. This is primarily because of the greater ease of administering a drug subcutaneously, rather than intravenously, as is required when aminophylline is given. When patients fail to respond to epinephrine solution, it is unwise to continue the administration of epinephrine, since it increases the danger of producing severe intractable asthma (status asthmaticus). It is advisable in such cases to avoid the use of epinephrine solution for about twenty-four hours

and to use aminophylline intravenously, together with other measures for relief. In many cases, after twenty-four hours of avoidance of epinephrine, it will again give relief. Epinephrine can then be given, alternating, if necessary, with aminophylline to avoid overdosing with epinephrine solution. In addition to the indication mentioned, aminophylline will in some cases produce a longer relief period than epinephrine solution. This is an individual variation and is not based on any difference in the type of asthma.

The dose of aminophylline for intravenous use is between 3½ and 7 grains (0.22 and 0.45 Gm.). In most cases the 3½ or 3¼ grain ampules (10 cc.) will give relief. Some cases may require the 7 grain ampules. If injected slowly, only minor disturbing symptoms (faintness, flushing or precordial distress) will occur during the injection. Great care should be taken to avoid subcutaneous spilling of the solution, as the material is quite irritating to the subcutaneous tissues.

CELIAC DISEASE AND VITAMIN DEFICIENCIES

To the Editor:—During the past four years some interesting observations have come to my attention while using vitamins B and K which I should like to record with the purpose of inquiring whether any similar observations have been made. In the treatment of 5 cases of celiac disease in children, a prompt improvement occurred following the use of vitamin B complex. The stools decreased in size, they assumed normal color, the abdominal contour returned to normal, the appetite increased and in a matter of three to six months the children became quite normal. In a number of patients who complained of fatigue and whose physical examinations were otherwise negative except for a progressive lowering of the blood pressure on changing from the reclining to the erect position (myasthenia gravis type of response) I have noticed that a course of B complex reversed this blood pressure reaction in most of the cases and at the same time caused a lessening of the fatigue. In 3 cases presenting the nephrotic syndrome of albuminuria, hypoproteinemia, water retention and reversal of the albumin-globulin ratio, I have noticed that the addition of vitamin K to whatever therapeutic regimen was being followed caused a disappearance of all these abnormal findings within a comparatively short time. I would appreciate any references in the literature which may be available relative to these notes.

William J. Farnes, M.D., Lakewood, Ohio.

ANSWER.—Attention may be called to a recent paper on this subject. May and his co-workers (*J. Pediat.* **21**:289 [Sept.] 1942) found that vitamin B complex given parenterally or by mouth caused a definite improvement in such patients. It allowed them to take essentially normal diets. The authors concluded tentatively that celiac disease is a deficiency disease relieved by these vitamins and by a crude extract of liver.

Impairment of intestinal functions of various kinds have been produced experimentally in animals by vitamin B deficient diets. These disabilities can certainly be remedied by the administration of vitamin B complex (McCarrison, Robert: Studies in Deficiency Disease, New York, University Press, 1921). Crude liver extract is claimed to have a beneficial effect in celiac disease comparable to its effects in the steatorrhea of sprue—possibly in part at least because of its content of certain constituents of the vitamin B complex.

As far as can be determined, no report has been published pertaining to the value of vitamin K in the treatment of the nephrotic syndrome. Since patients with long standing nephrosis nearly always suffer from some degree of undernutrition (owing primarily to poor appetite) and since some authors believe that liver function is impaired in this syndrome, it would not be surprising to find a favorable response to vitamin K administration. It should be noted, however, that hypoprothrombinemia is not characteristic of the nephrotic syndrome and patients or animals suffering from vitamin K deficiency do not ordinarily show signs of nephrosis.

OBESITY IN EUNUCHOID INDIVIDUALS

To the Editor:—Can the obesity in eunuchoid individuals be controlled by diet and systematic physical exercise, or can the condition be controlled only by the proper substitutive therapy?

Harry Rand, M.D., Springdale, Utah.

ANSWER.—If by obesity general obesity is meant, it is not clear that hypogonadism itself is responsible. When obesity and hypogonadism coexist, every effort should be made to demonstrate a hypothalamic lesion. In the absence of such evidence the two symptoms may be tentatively regarded as fortuitously associated. Regardless of the lesion, demonstrated weight loss will occur if dietary measures are undertaken. Localization of fat deposits about the mons and hips and in the breasts however may be properly regarded as favored by hypogonadism. These deposits are sensitive to undernutrition but may be less so than fat deposited elsewhere. The extent that substitution therapy favors resorption of such localized fat is not too well established, but such an influence may be expected. It must be coupled with suitable dietary restriction.

ABNORMALITY OF FINGERNAIL FROM TRAUMA

To the Editor:—We have under our care at this army hospital a man who contused his finger in a doorway, causing him to lose his nail. The new nail is growing in the opposite direction; that is, toward the middle phalanx. I do not have access to the literature at this post. I would appreciate any references or reprints of this condition described in the literature if there is anything available.

Glenn A. Deibert, Lieutenant, M. C., A. U. S.

ANSWER.—Although there are many references in the literature to nail abnormalities, those due to accident are rare. Only one reference has been found to a displacement similar to the one described in the query. A case of lupus vulgaris of the left little finger caused total destruction of the finger except for a dark brown nail, 4 mm. wide at the base and pointed, located at the level of the metacarpophalangeal joint. Its direction of growth was toward the shoulder (Heller, J.: Die Krankheiten der Nägel, *Handb. d. Haut u. Geschlechtskr.* **13**:363, Berlin, Julius Springer, 1927). An excellent article on plastic surgery of the finger and toe nails is that by J. E. Sheehan, (Replacement of Thumb Nail, THE JOURNAL, April 13, 1929, p. 1253).

TREATMENT OF RECURRENT HYPERTHYROIDISM

To the Editor:—Please advise me regarding the latest opinions relative to the treatment of hyperthyroidism by other than surgical measures. A man aged 35, who was operated on two years ago, now has a return of the condition with considerably more enlargement of the gland, and he dreads further surgical work. He read in *Hygeia* that some success had been obtained by roentgen treatments. I would appreciate any information which will help us reach a conclusion.

R. E. Hale, M.D., Bellamy, Ala.

ANSWER.—In most instances the treatment of hyperthyroidism is subtotal thyroidectomy after adequate preparation. This applies to recurrences as well as to the original attack. Roentgen therapy might be tried if operation is refused, but it has the disadvantage that a considerable length of time is necessary to determine whether or not it will be successful. Moreover, there is some danger of burning the skin, which may happen under the most carefully controlled circumstances. If the general condition of the patient is good and there is no vocal cord paralysis, there should not be any hesitation in urging further operation.

VITAMIN C AND DERMATITIS

To the Editor:—Is it possible for a deficiency in vitamin C or ascorbic acid to cause acneform or any other dermatitis of the face?

M.D., New York.

ANSWER.—It is not generally believed that deficiency in vitamin C causes acneform or any other dermatitis. It is possible that a deficiency in the vitamin may allow dermatitis to appear, whereas it might not be visible under optimal conditions. There is no proof of such a theoretical relationship; in fact, there is no good evidence for it. Ordinarily vitamins should be administered only when there is a demonstrated vitamin deficiency and not otherwise.

LYMPHEDEMA AFTER SPRAINED ANKLE

To the Editor:—On page 728 of the October 31 issue of The Journal, an inquiry is made concerning the cause of swelling of the ankle persisting long after a sprain was sustained. The reply concerns itself with local mechanical abnormalities as the basis for the persistence of swelling. Too little attention is paid to the existence of thrombophlebitis in the deep veins of the foot, ankle and calf in some of these cases. This explanation of the swelling will better fit the circumstances in some of these cases than mechanical instability. The diagnosis can be suspected on the clinical evidence alone and can be made with certainty by venographic visualization. If the diagnosis is confirmed, the treatment is that for thrombophlebitis, for which the newer methods such as sympathetic nerve block and vein ligation have recently been introduced. The appended references discuss the subject in adequate detail:

1. Homans, John: Circulatory Diseases of Extremities, New York, Macmillan Company, 1939.
2. Fine, Jacob, and Sears, J. B.: The Prophylaxis of Pulmonary Embolism by Division of the Femoral Vein, *Ann. Surg.* **114**:801 (Nov.) 1941.
3. Starr, Arnold; Frank, H. A., and Fine, Jacob: The Venographic Diagnosis of Thrombophlebitis of the Lower Extremities, THE JOURNAL, April 4, 1942, p. 1192.
4. Fine, Jacob; Frank, H. A., and Starr, Arnold: Recent Experiences with Thrombophlebitis of the Lower Extremity and Pulmonary Embolism: The Value of Venography as a Diagnostic Aid, *Ann. Surg.* **116**:574 (Oct.) 1942.
5. Bauer, G.: Early Diagnosis of Venous Thrombosis by Means of Venography and Abortive Treatment with Heparin, *Acta med. Scandinav.* **107**:136 (April 23) 1941.
6. Hellsten, W. O.: Phlebographic Studies and Heparin Treatment in Thromboembolic Diseases, *Acta chir. Scandinav.* **86**, Supp. 73, 1942.

Jacob Fine, M.D.,
Arnold Starr, M.D., Boston.

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